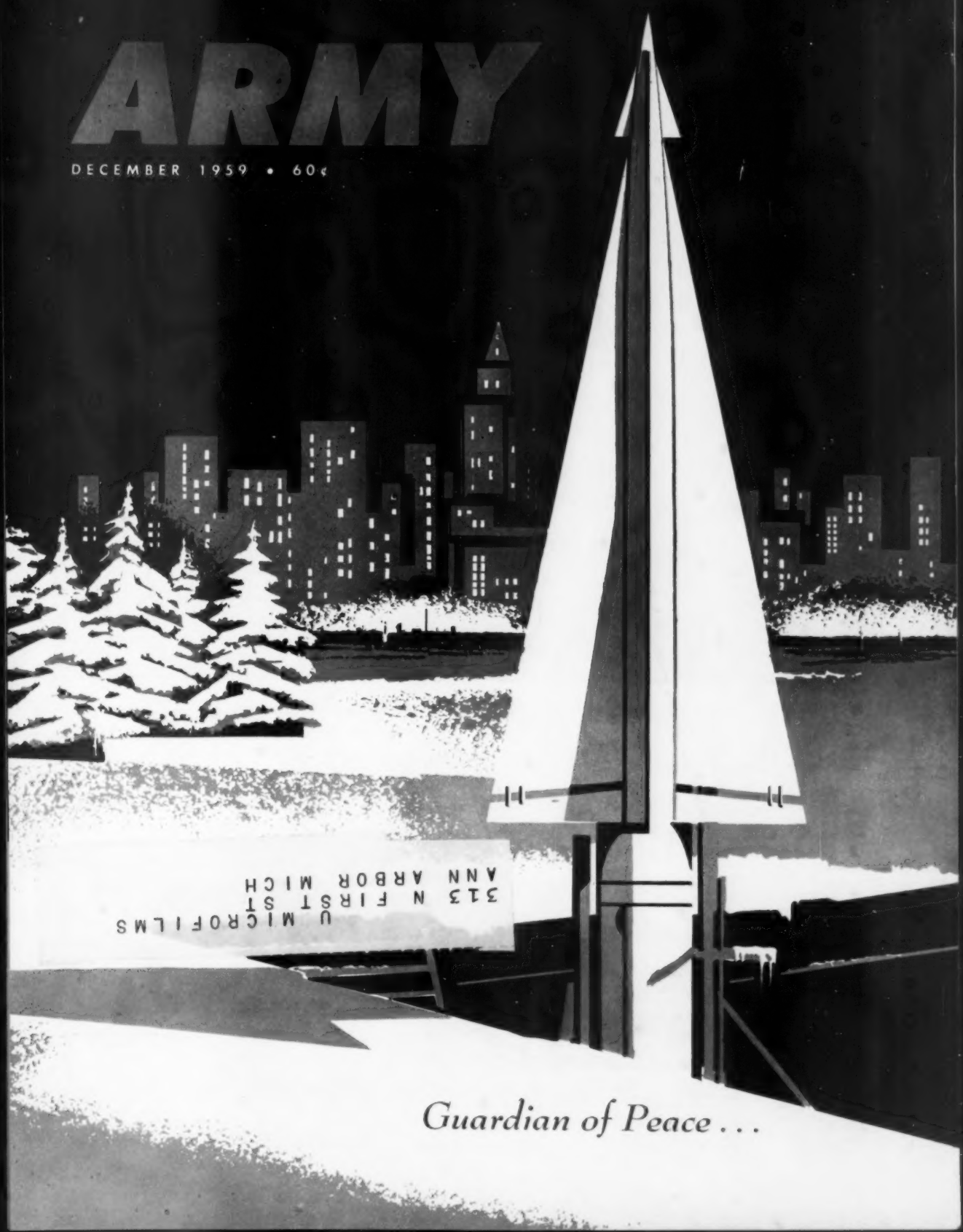
ARMY

DECEMBER 1959 • 60¢



Guardian of Peace . . .

LIEUT: 400 pounds? Atlanta to Cleveland—$31.90?

PHONE: Yes, sir. Including PU&D.

LIEUT: But that's $8.70 cheaper than surface!

PHONE: And it will arrive there tomorrow. For moving things *or* passengers, always rely on the Scheduled Airlines!*

*Compare surface with air! You'll save time and money when you fly your shipments via Scheduled Airlines Air Freight.

THE CERTIFICATED **Scheduled Airlines** OF THE U. S. A.

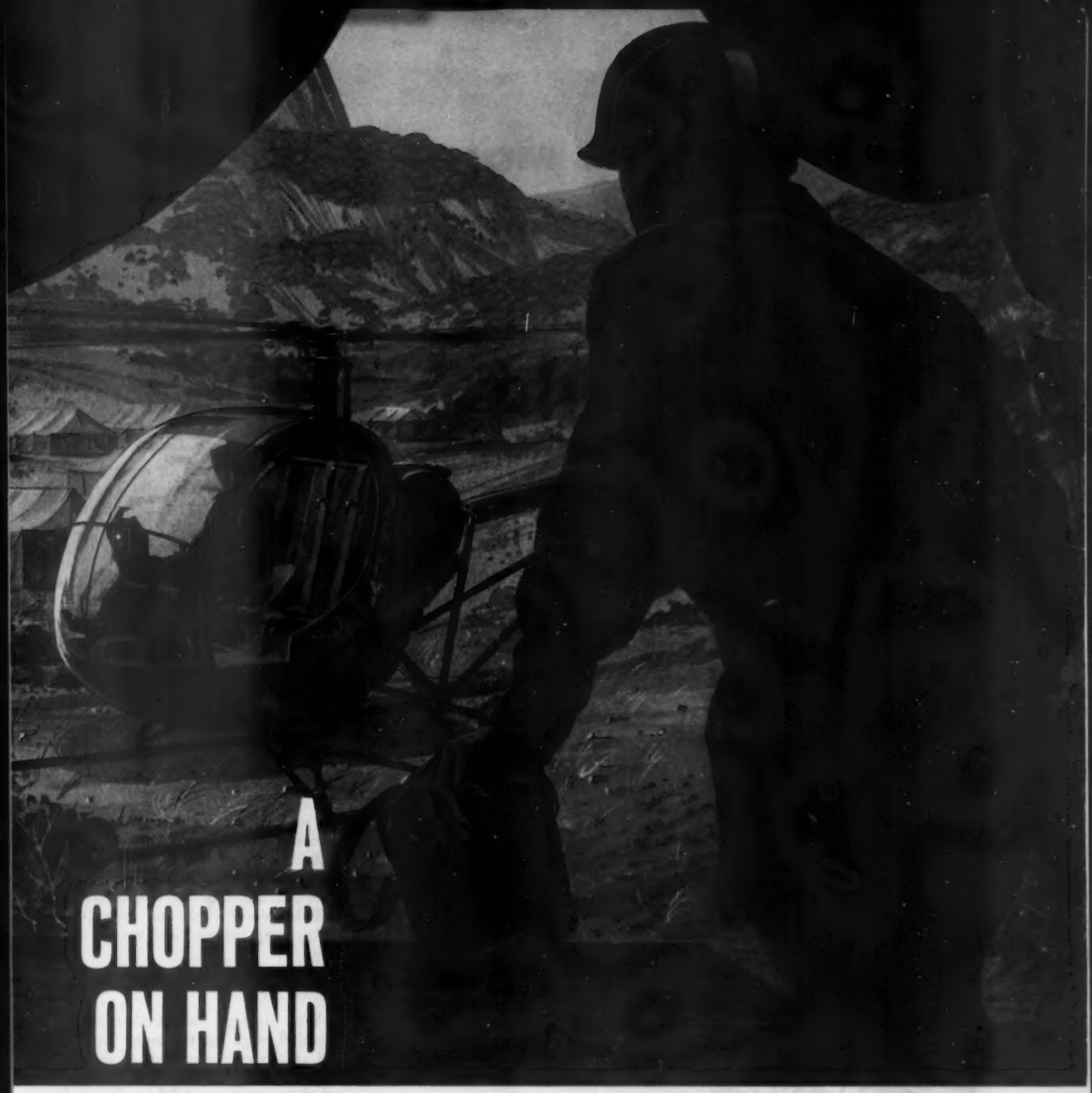
AAXICO AIRLINES
ALLEGHENY AIRLINES
AMERICAN AIRLINES
BONANZA AIR LINES
BRANIFF AIRWAYS
CAPITAL AIRLINES
CENTRAL AIRLINES

CHICAGO HELICOPTER AIRWAYS
CONTINENTAL AIR LINES
DELTA AIR LINES
EASTERN AIR LINES
ELLIS AIR LINES
THE FLYING TIGER LINE
FRONTIER AIRLINES

LAKE CENTRAL AIRLINES
LOS ANGELES AIRWAYS
MACKEY AIRLINES
MOHAWK AIRLINES
NATIONAL AIRLINES
NEW YORK AIRWAYS
NORTH CENTRAL AIRLINES

NORTHEAST AIRLINES
NORTHERN CONSOLIDATED AIRLINES
NORTHWEST ORIENT AIRLINES
OZARK AIR LINES
PACIFIC AIR LINES
PACIFIC NORTHERN AIRLINES
PIEDMONT AIRLINES

RIDDLE AIR LINES
SOUTHERN AIRWAYS
TRANS-TEXAS AIRWAYS
TRANS WORLD AIRLINES
UNITED AIR LINES
WEST COAST AIRLINES
WESTERN AIR LINES



A CHOPPER ON HAND IS WORTH TWO IN THE POOL

Parked right by his tent, immediately available for use...a helicopter for observation and liaison must be organic to the Company Commander's field operations in today's Pentomic Army.

The Hughes YHO-2HU is the first helicopter fully functional for Company-level operations. Easy on fuel...ruggedly built...this unique, 2-place helicopter reduces the logistics problem. It requires no special tools for field maintenance and few spare parts. Most maintenance can be done within the Company.

Major components—the engine, rotor systems, multiple belt drive clutch—can be removed and reinstalled as independent assemblies...in minutes!

The YHO-2HU is thoroughly evaluated and ready for procurement.

THE YHO-2HU COSTS HALF AS MUCH TO BUY—HALF AS MUCH TO USE—AND IS EXACTLY WHAT THE ARMY ASKED FOR!

Write for color brochure

DIRECTOR OF CUSTOMER RELATIONS
HUGHES TOOL COMPANY—AIRCRAFT DIVISION
CULVER CITY, CALIFORNIA

★the Fatigue Cap that never shows Fatigue!

And No Wonder! It keeps you looking sharp on the toughest duty! Stands any abuse. Collapse it, step on it, sit on it—it springs right back into shape—no extra stiffeners required!

- WON'T WRINKLE
- WON'T SAG

Wind resistant. water repellent
Can be dry cleaned.

INSIST ON THE NAME
Spring-Up
ON THE RED AND GREEN LABEL INSIDE YOUR CAP
IT IS YOUR GUARANTEE

GET IT AT YOUR EXCHANGE

If not available, order by mail. Sent prepaid anywhere in the world.

ONLY $2.00 postpaid

Be Sure—Specify your size

#8590 with inside ear flap
#8593 without flap

Write for Quantity Prices

Louisville CAP CORP.
303 S. 30TH STREET
LOUISVILLE 12, KENTUCKY

THE MONTH'S MAIL

IN FRONT OF THE 8-BALL

• The story of "The Eight-Ball Express" in your October issue is excellent. I don't know when I have enjoyed a yarn as much as I did that one.

REP. WALTER NORBLAD
Member, House Armed
Services Committee
Washington, D. C.

• Please allow me to congratulate Major Ben E. Spurlock for writing, and ARMY for publishing, the topnotch story, "The 8-Ball Express" [October], which is not only expertly put together and delightfully entertaining, but contains a great deal of sound guidance on the subject of leadership, presented in its most palatable form.

I got a special boot out of Lieutenant Shipp's tribulations as I recalled the days when I commanded (briefly, thank the Lord!) a similar "provisional" unit.

COL. WARD R. BETZ
Colorado Springs, Colo.

• Heartiest congratulations go to Chaplain Spurlock for a splendid story!

I got several belly laughs, a warm feeling of appreciation, even a definite inspiration as I was lifted from do-nothing doldrums for an organized attack on the tasks of the moment.

We shall be looking forward to more!

CHARLES W. SNOAD
Grants, N. M.

• All I can say is that the editors of ARMY have entered a new and exciting era when they published "The 8-Ball Express."

A touch like that every so often is highly desirable.

COL. F. GORHAM BRIGHAM, JR.
Boston, Mass.

• I wish to raise an objection to the "8-Ball Express" which I admit I have not read nor intend to.

I'm sick and tired of 8-Ball and misfits applied to Army units even in fiction, TV, etc. The cartoonist you usually use with his line drawings conveys this impression too.

Keep FICTION out. This is a professional magazine not designed to amuse.

There, I'm glad I said it.

COL. EXACERBATED
APO, San Francisco, Calif.

• We are interested in reprints of Lt. Shipp's Command Ordeal—"The 8-Ball Express"—to be used in the presentation of leadership instruction.

Are reprints available? We would like 250 copies.

COL. L. W. MERRIAM
PMST, N.C. State College
Raleigh, N. C.

• *Sorry, but we failed to arrange for reprints before the type was killed on this story.*—THE EDITORS.

• Congratulations, Major Spurlock! It's a relief to read a story that keeps a man from drink and steak, as it did me. Laughter and tears; may Major Spurlock give out with another brain child soon!

I add, only to lend the unnecessary and superficial adjunct of rank, that I'm a professional teacher of English and American literature, and in 21 years of reading short stories to my teen-agers, I confess this is the first I wouldn't dare read—because I could not do so objectively, being too glad and too sad all at once.

MAJ. W. E. CLARK
Omaha, Nebr.

• Well, sir, I got your October issue and clawed through the two usual hard-shell lead articles expecting more of the same, when I plumped unwittingly into this lush 22-page yarn of Major Spurlock's. After four pages, I had to look at the cover again to make sure I wasn't reading *The Saturday Evening Post.*

It is an excellent, educational, humorour thing—art work good too—and so I can appreciate why ARMY breaks all precedents in devoting so many pages to it. I hope someone besides your favored readers makes something out of it.

W. E. ROSEBUSH
Appleton, Wis.

• I don't know when I have enjoyed any article as much as I did Major Spurlock's "The 8-Ball Express." It has certainly given rise to a lot of new expressions here at the Defense Systems Labo-

ARMY is published monthly by the Association of the United States Army. Publication date: 25th of preceding month. Publication, Editorial and Executive Offices: 1529 Eighteenth Street, N.W., Washington 6, D. C. Copyright©, 1959, by Association of the United States Army. Second-class postage paid at Washington, D. C. and at additional mailing offices.

RATES. All new memberships and subscriptions and all foreign subscriptions payable in advance. Individual memberships: One year, $5; two years, $9; three years, $12. Subscriptions (these rates apply to unit funds, libraries, and other groups not eligible for membership): One year, $6; two years, $11; three years, $15. Additional postage to Canada and countries of the Postal Union of the Americas and Spain, $1 per year; other foreign countries, $2 per year. For other rates, write Circulation Manager, 1529 18th Street, N.W., Washington 6, D. C.

POSTMASTER: If this magazine is addressed to a member of the United States military service, whose address has been changed by official orders, it may be forwarded, except to overseas APO's, without additional postage. See section 157.4 Postal Manual. Send Form 3579 to **ARMY**, 1529 Eighteenth St., N.W., Washington 6, D. C.

ADVERTISING information and rates available from the Advertising Director or any of our advertising representatives, who are: **Walter E. Barber Co.**—New York, 516 Fifth Ave., MUrray Hill 2-5253; Chicago, 6 N. Michigan Ave., RAndolph 6-9500. **Duncan A. Scott**—San Francisco, 85 Post St., GArfield 1-7950; Los Angeles, 1901 W. Eighth St., DUnkirk 8-4151.

PROBLEM:

DESIGN AN ECONOMICALLY SOUND HEAVY-CARGO HELICOPTER

That's the challenge which has been answered by Hiller's tip turbo helicopter concept.

The Hiller engineering and manufacturing team has spent almost a decade perfecting the tip driven helicopter concept. Design studies, economic analyses, and theoretical advances, backed by data from thousands of hours of tip jet helicopter flight tests, point to this inescapable fact: that to satisfy all major design criteria **tip power must be used... and turbojet engines must supply that power.**

The Hiller tip turbo concept guarantees the most sought after characteristic in 25,000 lb. gross weight and up configurations—a high payload-to-gross weight ratio. Because the need for heavy and complex gear trains has been eliminated, weight is drastically reduced and development and manufacturing costs are brought—for the first time—down to sensible levels.

Tip power precludes the need for engine torque compensation and associated large tail booms and drives. Tip-mounted engines permit new freedom in the design of fuselage and cargo space configurations. Turbojet engines provide the range and low fuel consumption rates needed to make tip power economical. And the engines are in effect weightless... they replace the blade tip weights needed to keep coning angles down.

The need for heavy cargo and crane helicopters is growing. Hiller technology is ready now with the practical solution.

HILLER

AIRCRAFT CORPORATION

PALO ALTO, CALIF. • WASHINGTON, D. C.

ADHESIVE ENGINEERING DIVISION, SAN CARLOS, CALIF.

ratory of Syracuse University Research Corporation.

ANDREW LONGACRE

Syracuse, N. Y.

● Congratulations! The October issue contained three articles that appealed particularly to me. "The 8-Ball Express" on the humorous side; Colonel Zornig's "How Measure Mobility?" for stimulation and research; and Colonel Martin's "How Tall is a Russian?".

"The 8-Ball" added a bit of necessary color. "How Tall is a Russian?" received a bit of outside support from Mr. George Kennan during the week of 19-23 October in a press quotation.

"How Measure Mobility?" encourages thinking in the field of measurement, and some of my associates have commenced work anew on it.

COL. BLAIR E. HENDERSON

Fort Eustis, Va.

THANK YOU, SIR

● I really enjoy ARMY. I always thought that as *Army Combat Forces Journal* it was written for too high a level and wasn't of any value to the junior officer and noncommissioned officer. I am happy to report that this is no longer the case.

CAPT. WAYNE ROBINSON

Canton, Ill.

THE A-BOMB AND POLICY

● Colonel Bradley's article, "The Fallacy of a Dual Capability," in the October issue is extremely well written and very clearly states the problems faced by the Army today in maintaining a dual capability for combat. (Pointing out these problems may not have been his intent.)

From strictly a military point of view the article succinctly discusses the weaknesses of the present dual capability concept and the strength behind acknowledging the fact to the world that nuclear weapons would be used whenever it is deemed advantageous to the U. S. armed forces. Unfortunately, nuclear weapons and their use are viewed by many people with the same jaundiced eye as is the use of chemical weapons.

There are several interrelated factors that were not discussed and that should be considered. Will our allies allow us to pursue such a course, short of war? What of the friendly neutrals? What guides do the armed forces have for deciding what is a small war only and who is a weak enemy? (In the last-named factor, consider the war in Indochina.)

A policy for the U. S. armed forces such as Colonel Bradley suggests cannot long be kept a secret. Our allies and the friendly neutrals, without whom we cannot effectively wage a hot or a cold war, do not worry particularly because we have nuclear weapons. Their fear centers mainly around when we will use them, and what will be the cost. If we publicly announce their use in any type of war, the present fear of our allies who don't have them will be compounded, and there is the ever-present possibility that the neutrals will turn from us. Of course, once a war starts many of these problems tend to solve themselves. When this happens, the solution, unfortunately, is not always of our own choosing.

Air Vice Marshal Kingston-McCloughry in his book, *The Direction of War*, discussed the need for officials trained to weigh the economic, political and military factors preceding and during a war. Today, were these trained officials available and in positions where decisions are made, the friction and mistakes that have been and are being generated by our position in the world would be alleviated. Flexible guides could then be formulated for the use of nuclear weapons; after that our training and equipment problems should be solved more easily.

CAPT. PETER E. ARNOLD

Fort Bragg, N. C.

● It seems to me that the October issue of ARMY was put together backwards. "How Tall is a Russian?" should have come first. We can lick the Russians even if we have to use pitchforks, but it would be far easier and less costly in lives if we provided our army with the new weapons which have been developed to the prototype stage but never put into production.

The lead article, "The Fallacy of a Dual Capability," should have been last because it is the counsel of defeat which we do not accept. Colonel Bradley makes the point that Hitler did not use gas and germ warfare because it was not to his interest to do so. It was not to his interest because he knew he would get back as good as he gave.

Hitler started strategic bombing with the same idea that Kaiser William II had when he used gas in World War I: that he could strike a decisive blow that would forestall retaliation. Thanks to radar, Hit-

IDEAL CHRISTMAS GIFT

KAP-KIT®

U. S. PAT

A Fine Piece of Luggage

Positive Protection for 2 service caps from damage and dirt while traveling. Retards tarnishing of gold on cap—plus airtight cups for insignia, etc.

GET IT AT YOUR P. X.

If not available order direct. $18.50 tax paid, post paid, World-wide.

Louisville CAP CORPORATION

301 South 30th Street, Louisville 12, Kentucky

help on investing

for those in service at home and overseas

Could you use another source of income?—For your children's education, a retirement fund, or to help you stretch your service pay further?

To achieve these goals, thousands of service men and women have turned to Harris, Upham's Armed Forces Department for help in selecting dividend-paying common stocks, whose value tends to keep pace with living costs.

Our Armed Forces Department under General John E. Dahlquist (Retired) is experienced in helping military personnel with their specialized investment problems. It is backed by nationwide brokerage facilities in 36 offices from coast to coast—along with Harris, Upham's well-regarded Research and Mutual Fund Departments.

Our MILITARY INVESTMENT MANUAL describes our services, and explains the fundamentals of investing. If you are interested in extra income, you may obtain a free copy of this useful booklet simply by filling out and mailing the coupon below.

HARRIS, UPHAM & CO. BUSINESS ESTABLISHED

ARMED FORCES DEPARTMENT, HARRIS, UPHAM & CO.

Members New York Stock Exchange

1505 H Street, N.W., Washington, D.C., Att: General John E. Dahlquist, USA Ret.

Gentlemen: Please forward promptly a free copy of "The Military Investment Manual" AY

Name _____ *Rank* _____

Post or A.P.O. _____ *City* _____ *Zone* _____ *State* _____

SURVEILLANCE DRONE SYSTEMS BY AEROJET

The Army's AN/USD-2 is today's most advanced drone system for gathering information on enemy battlefields. This high priority Army program is a major part of Aerojet's acquisition of the Rheem Defense and Technical Products Division at Downey, California. Under the cognizance of Aerojet's Aeronautical Division, the SD-2 project is receiving increased emphasis during its advanced system development stages.

Developed for the Army Signal Corps, the SD-2 is launched from a standard Army trailer and flown by remote control to survey enemy positions. Its sensory compartment accommodates photo transmission systems, infrared, radar or other new electronic devices that transmit or bring back data. Outstanding characteristics of the SD-2 are the stable flight platform, sophisticated navigational system and unique parachute recovery, which make it ideal for a variety of military assignments.

Aerojet-General® CORPORATION

Plants at Azusa, Downey and near Sacramento, California

A SUBSIDIARY OF THE GENERAL TIRE AND RUBBER COMPANY

ler was proved wrong. If he had it to do again, you may be sure he would not make that mistake.

We used an atomic bomb on Hiroshima, knowing the Japanese could not retaliate in kind. If the Japanese had had an atomic bomb, we would not have used one because it would not have been to our advantage to do so. The Russians have atomic capability and delivery means, as we do. It is not to the interest of either to use atomic weapons. (See "The Game Theory in U. S. Strategy," *Fortune*, September 1959.)

I agree with Colonel Martin. We can lick them with conventional weapons but, if we can't, we would rather fight and run away to live to fight another day. Suicide is not in the American tradition.

DAVID C. PRINCE

Schenectady, N. Y.

NAIVE ARGUMENT

● Does Lieutenant Colonel James G. Martin in "How Tall is a Russian?" in the October issue of ARMY, think the so-and-sos will permit themselves to be defeated—and *not* take recourse to nuclear weapons?

The naïveté of Colonel Martin's argument does justice to George Kennan.

MAJ. WALTER DARNELL JACOBS

Arlington, Va.

MEDICAL SERVICE CORPS HISTORY

● The Historical Unit of the Army Medical Service is preparing the history of the U. S. Army Medical Service Corps. This history will analyze the organization, administration, and achievements of the Corps and its forerunners—the Sanitary Corps, Medical Administrative Corps, Pharmacy Corps, and Medical Service Corps.

Some very important information—letters, records, photographs, and articles of professional and scientific interest—is needed to highlight and augment official references. Undoubtedly, many of your readers possess information, either recorded or recollected, which can help assure completeness of this history.

It would be greatly appreciated if these persons would forward such information to the Director, Historical Unit, USAMEDS, Forest Glen Section, Walter Reed Army Medical Center, Washington 12, D. C. All material will be returned after reproduction or retained and filed in the Historical Unit, according to the desire of the owner.

COL. JOHN BOYD COATES, JR.
Editor in Chief

Washington, D. C.

MUSEUM PIECES NEEDED

● The Armed Forces Institute of Pathology will celebrate its 100th anniversary during and in connection with the Civil War Centennial. This Institute, jointly sponsored by the Army, Navy, and Air Forces, operates as one of its four major departments the Medical Museum in downtown Washington, which each year is visited by more than 300,000 persons.

Although many medical instruments and pathological and anatomical collections have been assembled for display during the lifetime of the Institute, there are gaps which we would like to fill for our coming centennial celebration. For example, few microscopes have been added to the collection during recent years, particularly covering the years since 1920. And although a great many historical instruments have been assembled for the Museum, there are very few of Confederate Army origin.

Budgetary limitations preclude the purchase of needed articles, but donations will be greatly appreciated. Donors will receive proper credit along with the assurance that their possessions will be carefully preserved for future generations.

I would like to hear from anyone possessing articles they feel would be suitable additions to the Museum's collection. All communications should be addressed to: Director, Armed Forces Institute of Pathology, Washington 25, D. C.

COL. FRANK M. TOWNSEND
Director

Washington, D. C.

FOR 10TH ARMORED VETERANS

● Veterans of the 10th Armored Division in the Washington area are interested in forming a local chapter. We would like to hear from any members who haven't received notification direct. Inquiries should be addressed to: Tiger Hunt, 2525 Bucklodge Road, Adelphi, Md. Or call HEmlock 4-4557.

E. L. LOIACONO
Acting Chairman, Publicity

MOVING?

Don't let us be a part of that notorious 3% that doesn't get the word. Send your change of address notice to ARMY, 1529 18th St., N.W., Washington 6, D. C. Be sure to give us your OLD address—EXACTLY as it appears on your latest issue, please—as well as your new address, including postal zone. Also, let us know when your change is to be made effective.

P.S. Get the word to your Postmaster too. Post Office Form 3575, available from any carrier or post office, will do the trick. If you are on active duty, put a note on this form that your change of address is due to official orders—this will insure forwarding of all your mail—except to and from an APO.

VOUGHT'S OPAL ADDS ACCURACY TO MOBILITY

Even the most complex missile can be made to keep up with a mobile task force. In fact, portable plants producing liquid oxygen now travel with the big missiles they fuel. The problem is, mobility means more than this.

Accuracy must be transportable, too. To the soldier on the launching team this means knowing *his own* location as well as the enemy's. This requires a means for instant orientation in the field.

This soldier would appreciate OPAL, a 35-pound electronic and optical package developed by Vought Electronics, a division of Chance Vought Aircraft, Incorporated. OPAL (Optical Platform Alignment Linkage) uses high precision optics and a sensitive detector to align remote inertial navigation systems in azimuth or to align entire missile systems. OPAL is fast. It is precise to within seconds of arc accuracy. It is sufficiently rugged to be air-dropped.

OPAL is typical of a lengthening list of Vought Electronics products – products which have battlefield applications. The alignment device, for example, is one of many items of ground support equipment in which the Vought division is qualified. Antennas and related electronics form another broad area with Army applications, and automatic power controls – including hydraulic actuators – form a third.

In addition to its development activities, Vought Electronics manufactures military systems and components. Other major interests are being advanced in the company's Aeronautics, Astronautics, Range Systems and Research Divisions.

CHANCE VOUGHT
DALLAS, TEXAS

"If we can move...we can whip 'em"

Cavalryman Phil Sheridan kept his maps in a pocket of his muddy coat. He read them like other men read their mail. "If we can move . . . something like this," he would suggest, with his finger tracing a bold path, "I think we can whip 'em." Sheridan, Lee, Stuart and the Civil War's other masters of mobility gave the world some classics of maneuver. Today their influence on U. S. Army tactical concepts is doubly significant. The Army's perimeter has become global. Threats must be met at any point on the compass. Movement in the Sheridan spirit is the answer: units that can move 4,000 miles in a day, and weapons specifically designed to move with them.

AERONAUTICS · ASTRONAUTICS · ELECTRONICS · GENESYS CORP · RANGE SYSTEMS · RESEARCH

CHANCE VOUGHT
DALLAS, TEXAS

ARMY

magazine of the
ASSOCIATION OF THE UNITED STATES ARMY

A PROFESSIONAL PUBLICATION DEVOTED TO THE ADVANCEMENT OF THE MILITARY ARTS AND SCIENCES AND REPRESENTING THE INTERESTS OF THE ENTIRE U. S. ARMY

VOL. 10 No. 5 DECEMBER 1959

EDITOR & PUBLISHER
Lt. Gen. Walter L. Weible, USA, Ret.

ASSISTANT PUBLISHER
Col. Arthur Symons, USAR

EXECUTIVE EDITOR
John B. Spore
Assistant—Annette Loukas

ASSOCIATE EDITORS
N. J. Anthony
Ray Ahearn

ADVERTISING & PROMOTION DIRECTOR
Col. Robert F. Cocklin, USAR

Assistants—Fred Donahue, Annette Leach, Joan Hansen, William Russell, Karen Hansen

BUSINESS MANAGER
Lt. Arthur S. Welch, DCARNG

CIRCULATION MANAGER
Dominic Mulloy

Assistants—Frances C. Van Dornes, Emma O. Snellings, Louise E. Ryan, Joyce Blair, Joyce Worley

COMMUNIST ILLUSION AND DEMOCRATIC REALITY. A demonstrated faith in the heritage of democracy is our mightiest weapon in the struggle for the minds of men. *J. Edgar Hoover* 14

OLD HAT WAR? Is the study of how World War II armies were raised, moved, supplied, and maneuvered and weaponed a retreat into antiquarianism? *Major Charles B. MacDonald* 23

THE FRAMES OF TIME. From the R&D paintbrush, a portrait of future hardware for the Army. *Major Patrick W. Powers* 28

THE CARE AND FEEDING OF INNOVATORS. The commander who can establish a healthy "climate of creativity" within his unit will master change instead of being mastered by it. *Lt. Col. Charles F. Austin* 38

THOUGHTS ON STRATEGY IN THE MISSILE AGE. A feature review of Dr. Bernard A. Brodie's "Strategy in the Missile Age." *Dr. Ellis A. Johnson* 46

MIND AGAINST NUKES. What do we now know about what nuclear firepower will do to the mind of the soldier on the battlefield? *Major John T. Burke* 52

THE DO-ERS. There is a Forgotten Man behind every successful innovation, without whom the most brilliant idea would be stillborn. *Master Sgt. Forrest K. Kleinman* 56

BANNER YEAR FOR ARMY MARKSMEN. The Army's marksmanship improvement program paid off in 1959, with teams scoring high in national and international competition. *Gen. Bruce C. Clarke* 58

DEEP PENETRATION PARACHUTE PATROLS. Hard-hitting, long-range parachute patrols can seriously disrupt enemy operations in advance of a major assault. *Major John M. Collins* 65

DEPARTMENTS

The Month's Mail	2	Irons in the Fire	73
Editorial	12	The Month's Books	74
The Month's Cerebrations	69	Report from AUSA	78

Articles appearing in Army do not necessarily reflect the opinion of the officers or members of the Council of Trustees of AUSA, or its editors. Articles signed by officers and men of the Army or by civilian employees of the Department of the Army are expressions of personal opinion, unless otherwise made manifest, and should not be interpreted as reflecting the official opinion of the Department of the Army or any Army command, installation or agency.

It takes three things to make a corporation versatile: large and varied facilities, a corps of experienced specialists...and administrators who can bring them all together. We have all three: whether the project product is large or small, simple or complex, we have the machines and the team to bring the contract through on schedule. In research, development, engineering, fabrication and assembly, American Car and Foundry can do almost anything with metal. Contact any American Car and Foundry sales office or Director of Defense Products, American Car and Foundry, Division of ACF Industries, Incorporated, 750 Third Avenue, New York 17, N. Y. *Sales Offices:* New York—Chicago—Cleveland—Washington, D. C.—Philadelphia—San Francisco—St. Louis.

Engineering and production versatility at ACF permitted the design, testing and mass production of the Army's M-52 Self-Propelled 105-mm. Howitzer vehicle

AMERICAN CAR AND FOUNDRY

DIVISION OF ACF INDUSTRIES, INCORPORATED

Products for Defense

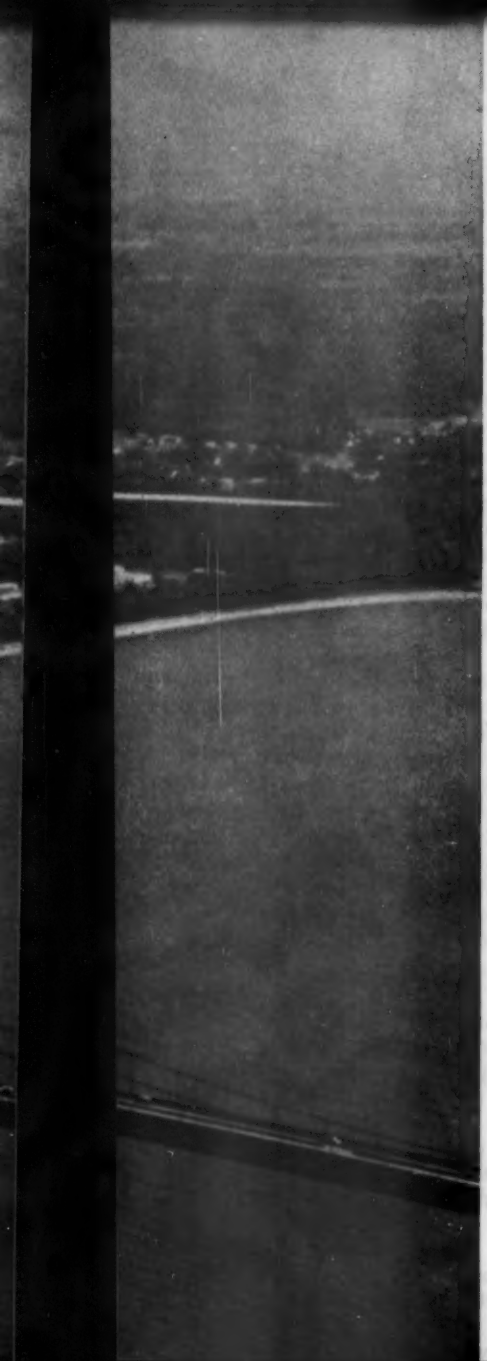
For example: Rocket Engine Cases • Missile Ground Support and Installation Equipment Artillery Shells • Radar Structural Members • Armor Plate • Armored Vehicles

AMERICAN CAR AND FOUNDRY CAN DO ANYTHING WITH METAL

The four-ton H-16, first in Vertol's series of turbine-powered helicopters, flown in 1955.

The H-21D research aircraft equipped with two GE T-58 turbo-shaft engines, flown in 1957.

The Vertol 105 with two Lycoming T-53 engines used in the test programs, flown in 1957.



Why Vertol leads in turbine helicopter design and development

Steady progress in technology has advanced this versatile air vehicle, the helicopter, to the threshold of a new era of usefulness. It is the era of the turbine-powered transport helicopter designed for improved battlefield mobility and logistical support of combat elements and missile systems, and for all-weather, day-night operations in military or commercial service.

Vertol has been and is today at the forefront in progress toward this new achievement. Among the first to recognize that turbine power would vastly improve performance, capacity and versatility, Vertol also is a leader in research and development on new designs incorporating these powerplants.

The result of many years of work in this field is the Vertol 107, first member of an entirely new generation of multi-turbine helicopters destined to play vital roles in short-range transportation throughout the world. It is now being produced for the U. S. Army as the YHC-1A. The "107" can be adapted to an almost limitless variety of functions without altering basic design. Its built-in growth potentiality has already resulted in a decision by the U. S. Military to procure a larger, more powerful version of the 107 type from Vertol. This growth also assures a steady future progression of helicopters of greater performance, load-carrying ability and versatility.

In 1958 the Vertol 76, powered by the Lycoming T-53 was the world's first successful tilt-wing VTOL.

VERTOL Aircraft Corporation

MORTON, PENNSYLVANIA

SUBSIDIARIES
ALLIED RESEARCH ASSOCIATES, INC. BOSTON, MASS.
VERTOL AIRCRAFT CO. (CANADA) LTD. ARNPRIOR, ONTARIO

SOME THINGS ARE UNCHANGING

War between industrialized nations is not simple, but extremely complex and the development of an effective military posture is similarly complex, demanding the weighing and assessment of innumerable variables many of which are often contradictory. Those who flatly assert that the Army has no valid role in general war and should confine itself to limited war disregard this and are engaged in dangerous over-simplification.

The Army's assigned mission is to conduct sustained military operations on land. This mission is not qualified or restricted or defined in terms of limited war, or general war, or any other single type of war. But to understand the Army's role in general war let's first ask what we mean by the term, "general war."

One good definition is that it is a war in which we or the Soviet Union would consider national survival to be at stake. Consequently, it is logical to assume that any weapons available would be used, at least as a last resort.

Popularly, at least, general war between the US and the USSR is visualized as a thermonuclear exchange, with the USSR striking the first blow and the US retaliating with whatever thermonuclear weapons and delivery vehicles survived the initial strike. According to this conception, only a few consequences would be possible. There could be mutual annihilation. Short of that, there could be such mutual devastation that neither opponent would have the heart to continue the struggle. Alternatively, there could be annihilation of only one belligerent, or such devastation of that belligerent that he would offer no further resistance to the *comparatively* unscathed victor.

The advocates of these views suggest, at least by implication, that there is no role for the Army in any of the situations envisioned. However, the superficiality of their basic premise provides the basis for refutation.

This premise appears to assume that the other nations of the world would either be included in the rain of mutual devastation, or that they would meekly accept the outcome of the struggle between the US and the USSR. It omits all consideration of the function which would be performed by our "trip-wire" or other forces already deployed alongside Allied soldiers in key strategic areas of the world. Finally, it ignores the fact that—short of mutual annihilation—final military victory in war goes to the nation which achieves and maintains control over the people of its enemy.

Against this background, the significance of the Army's assigned mission to conduct sustained military operations on land becomes clearer than ever.

An assigned function under this mission—a function which has indisputable application to general war—is the Army's duty of contributing importantly to the air defense of the Continental US.

This air defense capability provides a significant degree of assurance that an air-delivered thermonuclear attack today —or a missile-delivered attack in the future—could not destroy in an initial blow our ability to continue to fight. By the same token, the air defenses of the Soviet Union raise a real question as to whether our retaliation to a surprise attack could effectively destroy the Soviet capability to continue the war.

Once the possibility is granted—as it must be—that both sides could conceivably retain a capability to carry on after the opening thermonuclear exchange, it becomes necessary to consider a number of other factors.

Presumably, if the USSR launched a strategic thermonuclear strike against CONUS, it would simultaneously launch a ground attack, with the aim of overrunning the territory of Allied countries. Successful defense against such an attack requires adequate forces on the ground. It does so because, if strategic retaliatory forces comprised our only capability, there could be no question of *defense*. At best, there could only be a possibility of *liberation*. From the Allies' viewpoint, "liberation" by US bombers would quite possibly be far more devastating than occupation by the Red Army. Political and psychological factors aside, from purely military considerations our hope for final success would depend on our retention of geographical areas essential to launch an eventual counteroffensive.

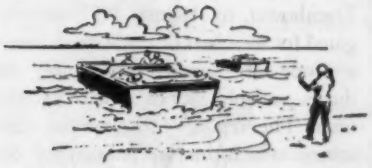
Our Allies play a vital part in providing the ground strength necessary to meet, defeat, and counter a Soviet attack. However, the U. S. Army has vital responsibilities in making this Allied strength a reality. For one thing, our Army's existence in adequate strength, and especially the presence of its elements overseas, provide necessary proof both of our ability to respond to attack in a manner acceptable to the people of the Allied countries and of our determination to do so.

Still another consideration is that an exchange of thermonuclear blows would surely leave the US and the USSR substantially weakened; the margin of superiority of military strength which they possess in comparison with the other nations of the world would be reduced. It is conceivable, at least, that a third nation—not committed on either side at the opening stage—could seek to capitalize on such a situation. We might well be compelled to defend ourselves against an attack from some new quarter in the second phase of the war.

In the light of these various considerations, it seems obvious that any argument which denies the vital contribution which the Army must make to our capability for the effective conduct of general as well as all other forms of war—and therefore for determining them—is based on assumptions which are completely unwarranted.

There is nothing new about the foundation of the Army's belief that the control of land is the final key to victory and that such control can only be asserted or denied by forces on the ground. The fact that it is not new does not mean that it is untrue. Some things are unchanging.

NOW..."PACKAGED" EARLY WARNING RADAR



Easily transported to tactical areas by land, sea or air it is quickly readied for long and short range action

Easily transportable and quickly operational—that's the new "TEW" (Tactical Early Warning) radar system developed by Sperry's Surface Armament Division for the Marine Corps. Only one-fourth the size and weight of conventional radars, TEW—designated MPS-21—is easily carried to tactical areas by helicopter, cargo plane, truck or amphibious vehicle. Within two hours, an 18-man crew can erect the system and put it into operation.

Designed to detect both close-in and distant supersonic aircraft and missiles, TEW also determines their height—combining the functions of two present radar systems. Operation is almost completely automatic. Only one operator is required to monitor the control console. Radar console and rotating antenna are housed in an inflatable radome, which can withstand the rigors of arctic or tropical climates.

With its very long range and portable construction, TEW provides the means to extend the nation's defense perimeter and insure added protection for key installations and outposts. TEW is another important Sperry contribution to our growing power to deter aggression.

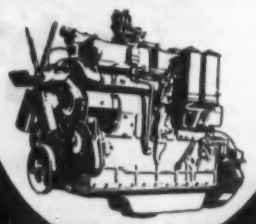
SPERRY

SURFACE ARMAMENT DIVISION, *SPERRY GYROSCOPE COMPANY • DIVISION OF SPERRY RAND CORPORATION, GREAT NECK, N.Y.*

—AS ALWAYS—
You Can Put Full Confidence in the Products That Feature
CONTINENTAL RED SEAL POWER

No matter what the exact requirement of the job, there's a Continental Red Seal model engineered and built to meet it down to the last detail. In the industrial line alone there are 60 basic engine models from 15 to 260 horsepower. You find Red Seals in military equipment of all descriptions, in transportation, and in many other specialized fields. You can put full confidence in the product that is Continental-powered. An abbreviated list of end uses is shown below.

AIR COMPRESSORS
UTILITY AND TRAINER AIRCRAFT
HELICOPTERS
FARM TRACTORS, COMBINES, THRESHERS
CONCRETE MIXERS AND PAVERS
EARTH MOVERS
ELECTRIC WELDERS
HIGH LIFTS AND HOISTS
INDUSTRIAL TRUCKS
IRRIGATION PUMPS
OIL FIELD MACHINERY
TANKS
TRUCK TRACTORS
STREET FLUSHERS AND SWEEPERS
WINCHES
AND OTHER SPECIALIZED POWER EQUIPMENT



PARTS AND SERVICE EVERYWHERE

Continental Motors Corporation
MUSKEGON AND DETROIT

COMMUNIST ILLUSION AND DEMOCRATIC REALITY

Condensed from an address by

J. EDGAR HOOVER
Director, Federal Bureau of Investigation

OUR way of life is so far superior, both spiritually and materially, to communist totalitarianism that, until recently, we assumed that our citizens did not need any specialized knowledge or training to withstand communist psychological pressures. This somewhat naive presumption was abruptly dispelled during the Korean War. In military combat on the battlefield, the men of our fighting forces acquitted themselves admirably. Unfortunately, however, in the individual, personal, ideological conflict with their communist captors, some American prisoners of war capitulated. The majority of these who collaborated with the Chinese communists were unable to resist communist indoctrination by practitioners skilled in the technique of the Big Lie.

A five-year study of the conduct of American prisoners of war during the Korean conflict was made by the United States Army. The findings of this study are disturbing.

* * *

As a result of the study, President Eisenhower, in August, 1955, promulgated for members of the Armed Forces a Code of Conduct specifying the duties and obligations of our fighting men. The report of the special committee which had recommended the adoption of this code pointedly revealed:

"The uninformed P.O.W.'s were up against it. They couldn't answer arguments in favor of communism with arguments in favor of Americanism because they knew very little about their America. . . ."

Behind Their Failure

The report concluded that our Armed Forces had not adequately prepared their men for the rigors of communist indoctrination. It looked behind this failure, however, and stressed that our homes, schools, churches, and patriotic organizations must also assume greater responsibility in educating Americans in the principles which underlie our democratic way of life. The importance of such an affirmative long-range educational program is borne out by the special committee's finding that, in many cases, our fighting men were at a disadvantage because they knew less about the ideals and traditions of their own country than did their communist interrogators.

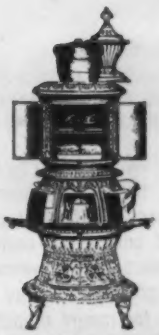
Exposure and Education

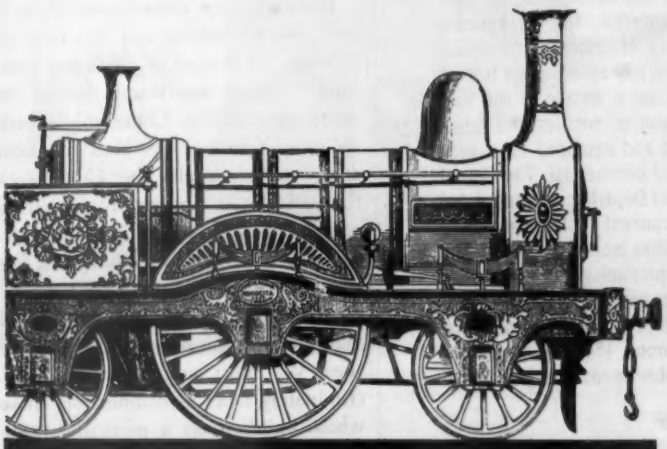
The behavior of these prisoners of war was less an individual failure than it was an indictment of a society which had not prepared them adequately for their head-on collision with communist indoctrination. All Americans must share some responsibility for the conduct of these prisoners of war. More important, we must not ignore this forceful example of the impact of communist psychological pressures. Our continued survival may well depend upon the action we take now to insure that all citizens, not only military personnel, are fortified against the continuous communist ideological assault.

We can defeat communist ideology and—at the same time—reinforce the structure of our own democracy by the combined process of exposure and education.

The illusions of communism cannot withstand the penetrating light of truth. For a number of years, congressional and state investigations of communism, essential for the consideration of legislation, have focused the

MARTIN
IS IN
THE NUCLEAR
BUSINESS





Current Martin Nuclear Division Programs:

Portable Packaged Power Plants

Plate, Tubular, & Ceramic Fuel Elements

Liquid Fluidized Bed Reactor

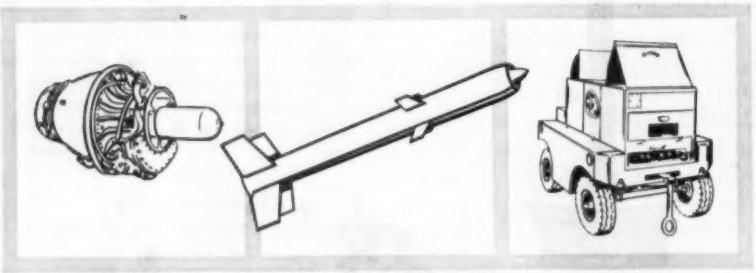
Radionuclide Power Sources

MARTIN

The eight divisions of The Martin Company are Activation, Baltimore, Cocoa, Denver, Nuclear, Orlando, RIAS, and Space Flight.

CAE POWER

- Research
- Development
- Production



TURBINE PROPULSION | SOLID FUEL – RAMJET PROPULSION | GROUND SUPPORT

● Continental Aviation & Engineering Corp. is exceptionally well qualified, both by experience and by facilities, for work on the weapons systems of tomorrow. Our background embraces not only a half-century of internal combustion engine experience, but also years of pioneering in gas turbine engine development, and more than a decade in the field of solid fuels for ramjet propulsion of missiles and target drones . . . Continental is staffed and equipped for a wide range of assignments, military and commercial. The Detroit Division Research and Development Department is supported by our modern-to-the-minute Component Testing Laboratory complete with environmental facilities located at Toledo. The Toledo Production Division now producing various turbine engines in volume is capable of supporting diversified programs . . . The CAE record of achievement is one of which many a larger company might be proud. Inquiries are invited from those having propulsion problems, on the ground, on the water, in the air.

☆ ☆ ☆

CONTINENTAL AVIATION & ENGINEERING CORPORATION

12700 KERCHEVAL AVENUE, DETROIT 15, MICHIGAN

SUBSIDIARY OF CONTINENTAL MOTORS CORPORATION

pitiless glare of publicity on many phases of communist activity. The reports of these investigative bodies are readily available and include detailed information regarding the activities of the Communist Party, USA, throughout the country. . . .

The effectiveness of these investigative committees in exposing the aims, principles, and methods of communism can best be measured by the bitterness and the intensity of communist attacks upon them, as well as by the continuous communist campaigns to abolish them.

* * *

Dual-Purpose Education

Every exposure of communism's false premises, inherent contradictions, deceitful tactics, and empty promises helps to shatter its ideological appeal and to fortify against its psychological pressures.

But, in this struggle for men's minds, exposure alone is not enough. Exposure must be complemented by a long-range educational program with a dual purpose. This program must encompass, not only a penetrating study of communism, but also a thorough grounding in the basic principles of our individual freedom under law. . . .

Knowing what communism really is and how it operates will also help us to avoid the danger of confusing communism with legitimate dissent on controversial issues. Communism feeds on social ferment. On both the local and national levels, the Communist Party, USA, is continually exploiting social, economic, and political grievances for its own tactical purposes. For this reason, the "Party line" will frequently coincide with the views of many noncommunists on specific issues. We must not, therefore, indiscriminately label as communists those whose opinions on a particular question may, on occasion, parallel the official Party position. We must also guard against the tendency to characterize as communists those who merely disagree with us or who advocate unorthodox or unpopular beliefs.

When anyone is erroneously branded a communist, it not only constitutes an injustice to the individual, but also

(*Continued on page* 72)

SEASONED IN THE SERVICE

William Wheeler, vice president in charge of Motorola's Military Electronics Division discusses participation role in the B-70 project being developed for the Strategic Air Command at North American.

"North American's pre-award analysis and evaluation, before awarding the contract for the Mission and Traffic Control System of the B-70 Valkyrie to Motorola, was one of the most thorough and extensive ever made."— North American Aviation, Inc.

On the next two pages: Motorola's Seasoned Military Service Record.

Since before World War II, Motorola has demonstrated its exceptional ability in military electronics on assignments that include communications equipment... radar... missile guidance... data processing and display... antisubmarine warfare... demonstrating with each success the value of a technical task force that is...

Roy Olson, general manager of Motorola's Chicago Military Electronics Center, which emphasizes work in surface and subsurface electronic equipments and systems.

Seasoned in the service

Hundreds of thousands of Motorola walkie-talkies were produced for World War II combat use.

Few weapon systems now under development are expected to play as important a role in U.S. defense in the coming decade as the B-70 Valkyrie. This fantastic new weapon will cruise at more than 2000 m.p.h. at altitudes over 70,000 feet.

Motorola's long record of military electronic achievements led to its appointment as major systems manager to develop and build the B-70's vital Mission and Traffic Control System.

This major system encompasses the communications, navigation, identification (IFF), and landing aids. It will keep B-70 crews in constant contact with each other and with U.S. headquarters from anywhere on the globe. It will provide the Valkyrie with its capability to be electronically directed to a designated target anywhere in the world and be immediately recalled on command.

High-level responsibilities such as this are not new to Motorola. It was in June of 1940 that the prototypes of the history-making Motorola walkie-talkie were delivered to the U.S. Army Signal Corps. During World War II, Motorola not only supplied vast quantities of equipment that kept advancing U.S. ground troops in constant communications, but was also chosen by the Signal Corps to direct and manage the supply of the entire U.S. Army's need for electronic crystals. These critical frequency-determining components were vital to radio communications.

In the late forties and early fifties it was weapon fuses, radar bombsights and tactical microwave communications. Today, in company-owned research and production centers across the country, thousands of Motorola engineers and scientists are at work on a broad range of military projects. Included are missile guidance, high-resolution radar, sonobuoys, the next generation of equipment for radio-telephone communications between ground troops, and advancement of the frontier of knowledge in solid-state electronics.

Motorola's exclusive concentration in electronics, its cost-conscious approach to producibility, and its preoccupation with reliability are evident in every military product from the smallest solid-state device to the most complex weapon systems. Small wonder that with the military, Motorola rates one of the highest confidence quotients among suppliers of electronics equipment. For in the development and production of military electronics, it has been proved time after time, *there is no substitute for seasoned experience.*

For a comprehensive brochure on Motorola's Military Electronics capabilities, write Technical Data Service, Motorola, Inc., Military Electronics Division, 8201 East McDowell Road, Scottsdale, Arizona.

MOTOROLA

Military Electronics Division / CHICAGO • PHOENIX • RIVERSIDE

Career opportunities await engineers and physicists at Motorola. Address your inquiry to the area of your choice:

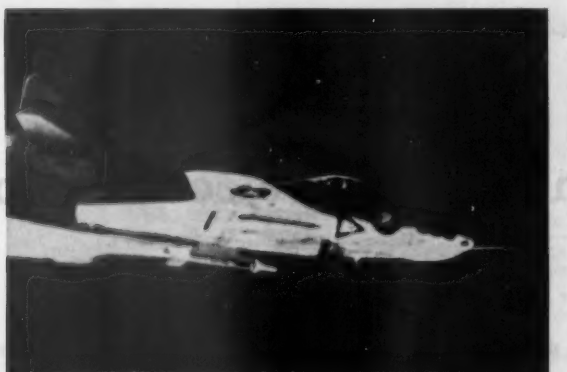
8201 East McDowell Road, Scottsdale, Arizona • 1450 North Cicero Avenue, Chicago 51, Illinois
8330 Indiana Avenue, Riverside, California

Joe Chambers, Motorola vice president and general manager of the Western Military Electronics Center, directs Phoenix laboratories concerned primarily with work on sophisticated airborne and spaceborne electronics.

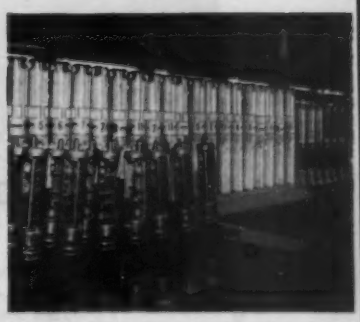
John Byrne heads highly classified advanced study and developmental work on a wide variety of military contracts at Motorola's Systems Research Laboratory, Riverside, California.

Development of passive seeker by Motorola, Riverside, is under contract to the Signal Corps for use with U.S. Army drones capable of performing night, day, and all-weather surveillance.

Motorola's surging capabilities in the solid state electronics art is achieving new dimensions in complexity, performance and reliability for new electronic concepts.



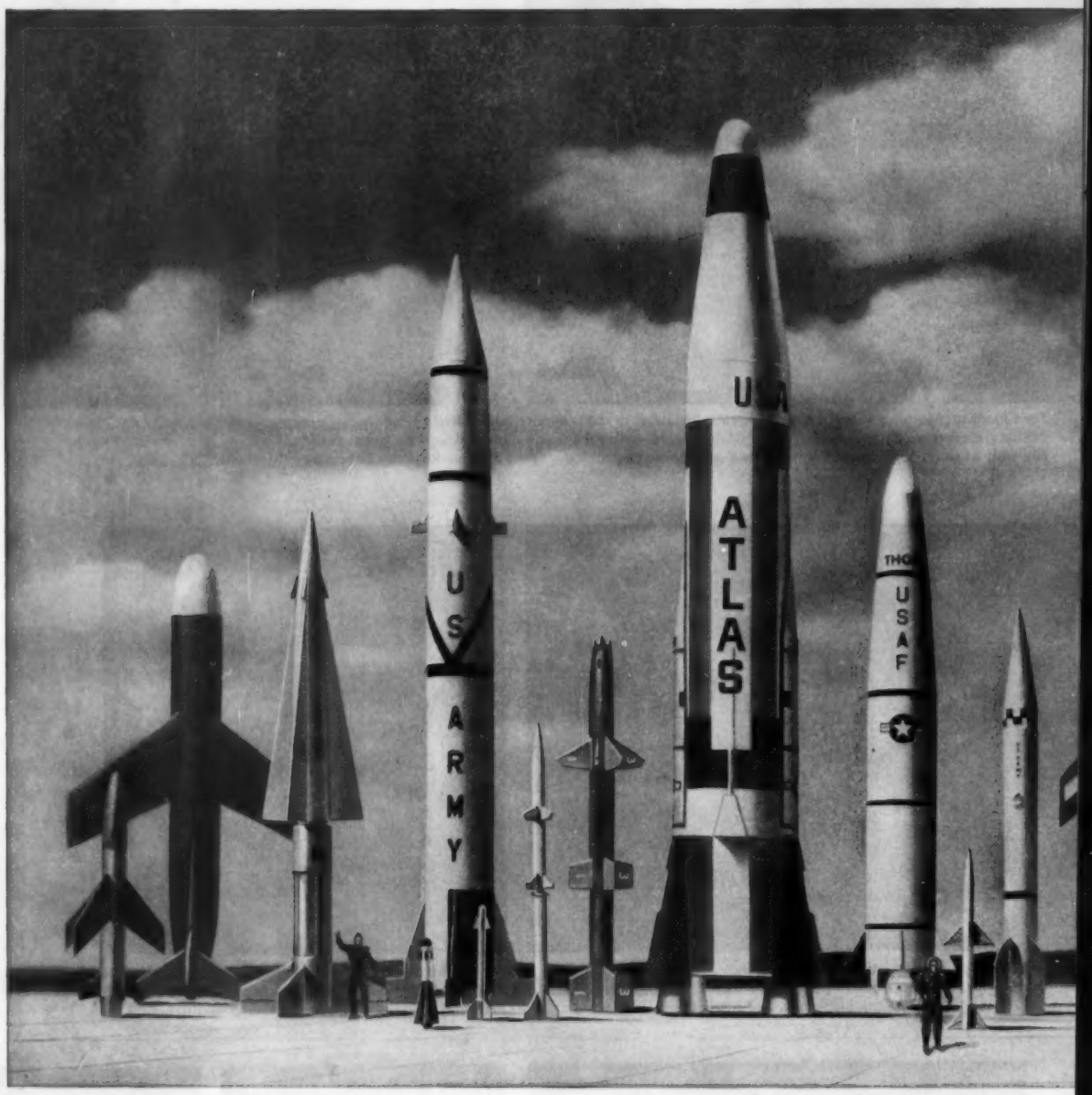
Inspection, the eyes of quality control, helps convert experience into reliability at Motorola.



AN/SSQ-23 Sonobuoys for the anti-submarine warfare program in volume production at Motorola Chicago.

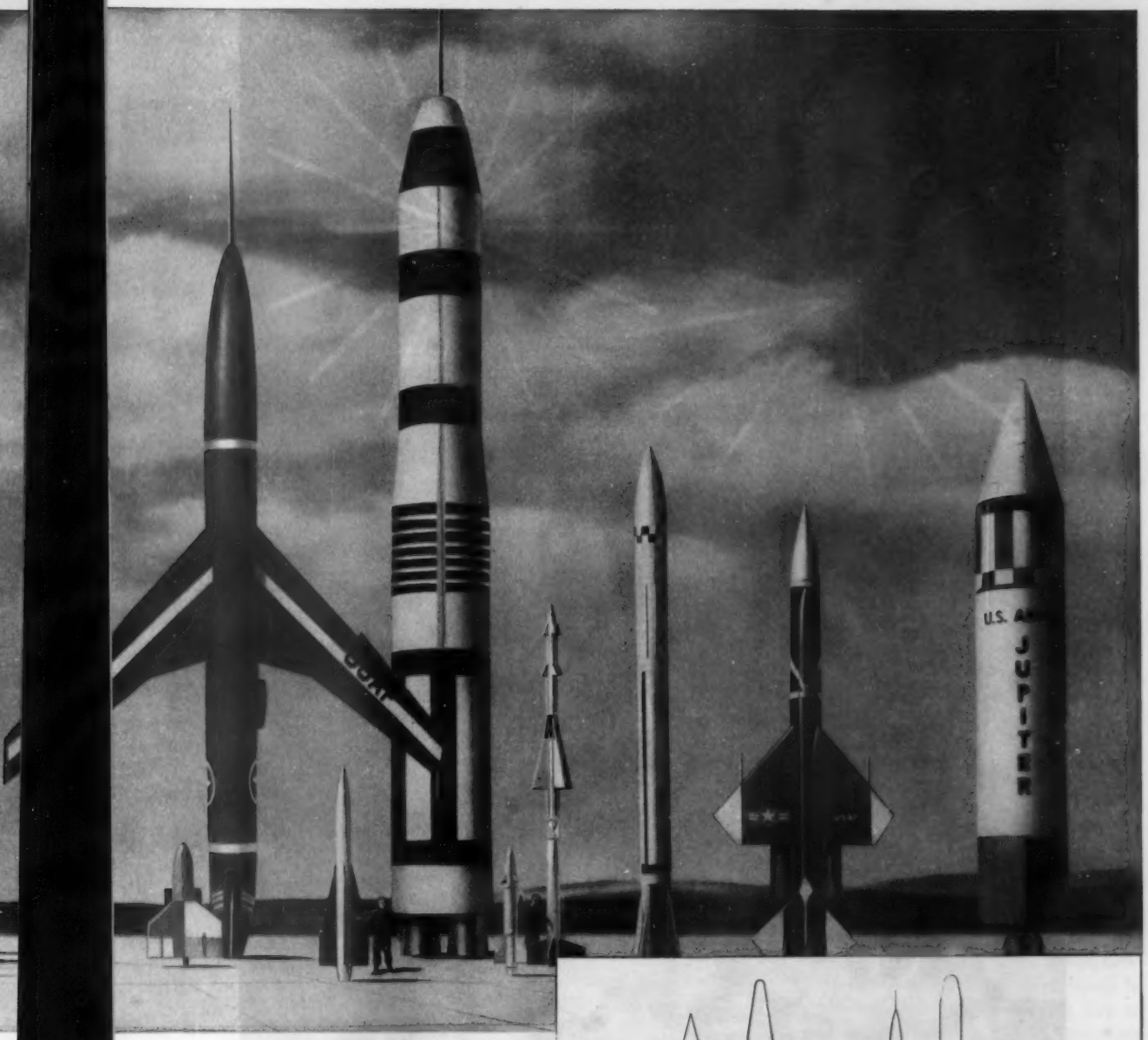
Motorola is making significant design contributions to advanced guidance head for Sidewinder air-to-air missile which is under fabrication at Phoenix laboratories.

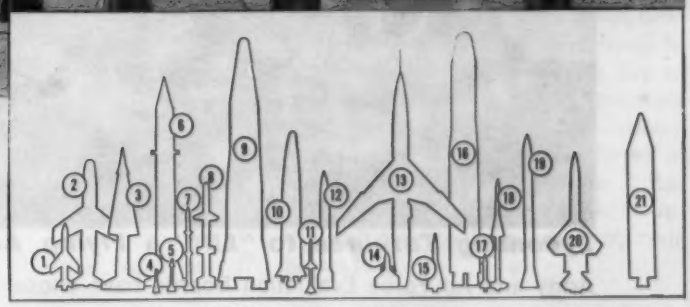
AD 4015-0



21 U.S. missiles rely on Raytheon electron tubes

RAYTHEON COMPANY, WALTHAM, MASS. RAYTHEON *EXCELLENCE IN ELECTRONICS*





1. **Lacrosse.** Army. Ground-to-ground. Prime contractor: Martin.
2. **Mace.** Air Force. Ground-to-ground. Prime contractor: Martin.
3. **Nike Hercules.** Army. Ground-to-air. Prime contractor: Western Electric.
4. **Falcon.** Air Force. Air-to-air. Prime contractor: Hughes.
5. **Sidewinder (GAR-8).** Navy/Air Force. Air-to-air. Prime contractors: Philco; General Electric.
6. **Redstone.** Army. Ground-to-ground. Prime contractor: Chrysler Corp.
7. **Terrier.** Navy. Surface-to-air. Prime contractor: Convair.
8. **Talos.** Navy. Surface-to-air. Prime contractor: Bendix Aviation.
9. **Atlas.** Air Force. Ground-to-ground. Prime contractor: Convair.
10. **Thor.** Air Force. Ground-to-ground. Prime contractor: Douglas.
11. **Sparrow III.** Navy. Air-to-air. Prime contractor: Raytheon.
12. **Sergeant.** Army. Ground-to-ground. Prime contractor: Sperry Rand.
13. **Snark.** Air Force. Ground-to-ground. Prime contractor: Northrop.
14. **Quail.** Air Force. Air-to-ground. Prime contractor: McDonnell.
15. **Hawk.** Army. Ground-to-air. Prime contractor: Raytheon.
16. **Titan.** Air Force. Ground-to-ground. Prime contractor: Martin.
17. **Bullpup.** Navy. Air-to-ground. Prime contractor: Martin.
18. **Nike Ajax.** Army. Ground-to-air. Prime contractor: Western Electric.
19. **Corporal.** Army. Ground-to-ground. Prime contractors: Firestone; Gilfillan.
20. **Bomarc.** Air Force. Ground-to-air. Prime contractor: Boeing.
21. **Jupiter.** Army. Ground-to-ground. Prime contractor. Chrysler Corp.

Lycoming Turbines to "Lift" a Flying Army—After exhaustive study, Army and Air Force Evaluation Boards have chosen Avco/Lycoming's T 55 turbine engine for a key assignment in America's new and highly mobile Pentomic Army. Its mission: to power the Vertol "Chinook" all-weather troop and transport copter. The powerful, versatile T 55 is another Avco milestone in the turbine power revolution.

AVCO

AVCO MAKES THINGS BETTER FOR AMERICA / AVCO CORPORATION / 750 THIRD AVENUE, NEW YORK 17, N. Y.

Old Hat War?

Is the study of the way World War II armies were raised, moved, supplied, maneuvered and weaponed a retreat into antiquarianism?

Major CHARLES B. MacDONALD

World War II is old hat, the colonel said. Why study World War II when already we have passed the jet age and entered the missile age? What's the use learning about World War II when we have the atomic bomb?

Coming from one rank-and-file officer, this statement might be something less than distressing. But discovering that the viewpoint is prevalent among many in responsible positions today makes the matter downright alarming.

Look at the French, the colonel says. They tried to fight World War II in the image of World War I. Remember what happened in 1940?

This is the pitfall, the colonel goes on. You can't fight the next war in terms of the last.

Nobody could agree more wholeheartedly than the historian. In preserving on paper the experience of war, the historian is not trying to perpetuate the methods of earlier success or failure. What he is trying to do is maintain the past as a ready reservoir of vicarious experience for use by the present and the future.

The trouble with the French was not that they studied World War I too much. The trouble was that they failed to perceive the real lessons of it and to look on the facts of World War I with sufficient vision to foresee the pattern of World War II. Just as misinterpretation of the Franco-Prussian War of 1870 had led the French into undue emphasis on the offensive, so their deductions from World War I led them to unjustified endorsement of the defensive.

Let us not forget that the Germans also studied World War I. The difference was that the Germans concentrated not on the successes of the defensive but on those occasions when both sides penetrated the other's defense only to see the drives falter for lack of speedy and powerful exploitation. This prompted them to marry the tank *en masse* to the dive bomber and arrive at the spectacularly successful formula of Blitzkrieg.

But the bomb, *the colonel says. The bomb is different from the tank. The bomb has changed everything.*

What bomb? the veteran of Korea might ask.

Limited wars after the pattern of Korea are not new, nor is Korea likely to be the last one. Will the *bomb* be used in this kind of war? No one can say with any assurance that he is right. How old hat is the experience of World War II? The commanders in Korea encountered few if any situations which their prototypes in the widespread, diverse fighting of World War II had not already experienced. What is more, much of this experience already had been set down on paper, available only for the reading.

But our ultimate survival, the colonel says, will depend not on limited wars; it will depend on another wholesale conflagration. What then about the bomb?

The awesome proportions of the destructive power of thermonuclear weapons too often discourage the obvious answer to this query. But the fact is, other innovations in weapons—the crossbow, gunpowder—had an impact on their time as staggering in some respects as the split-

---

Major Charles B. MacDonald, Staff Specialist, USAR, is a civilian historian in the Office of the Chief of Military History. He is co-author of *Three Battles: Arnaville, Altuzzo, and Schmidt,* recently completed *The Siegfried Line Campaign,* and is at work on *The Last Offensive,* all volumes in the Army's official history of World War II. His own combat experiences in the 23d Infantry (2nd Infantry Division) are recorded in Company Commander (1947). Major MacDonald spent a year in Europe studying the relation of terrain and military history under a Secretary of the Army Research and Study Fellowship.

From El Alamein to Bataan . . . from Stalingrad to Okinawa . . . from the Huertgen Forest to Shaduzup—the campaigns of World War II were decided by foot soldiers on the ground. Sea and air power opened the doors and paved the way but ground armies were the ultimate weapon of global victory. What lessons are lasting in these brief photographic flashbacks of warfare, M-World War II?

The long road to Tokyo was barred by Japanese dug into jungles like this one on Leyte. Will the pattern of jungle fighting be repeated in future war? And though it is not repeated, will not the same skills and fortitude be required of the men who close with the enemy?

The lexicon of military history had it that the assault of a hostile shore was most difficult, but such assaults became SOP in all theaters except the Russian. Shown here is an assault on a Pacific island.

Though they still moved at the pace of walking soldiers, armies became mechanized and the pattern of future mobility was discerned by war's end. The scene above is of an historic occasion—the junction of the U. S. First and Third Armies during the Battle of the Bulge.

The fire power of heavy artillery standing almost hub-to-hub helps clear the way through a Pacific jungle for advancing infantry. Though the weapons of a future war are atomic, how will the tactical objectives differ from those of World War II?

ting of the atom on ours. Yet armies continued to fight, adapting their tactics to the new weapons. They abandoned their compact formations, they dug holes in the ground, they inevitably came up with countermeasures, much as we are trying to do today. And man and civilization have continued to survive.

Even so, we must consider that nuclear weapons are so much more destructive as to be different not in degree but in kind. If they are employed in wholesale fashion, perhaps armies will not be used at all. Would not war then be fought, as many have suggested, by a handful of men in fallout-proof hideaways pressing buttons *A* and *B*?

Translate past events into the future

If this proves to be the case, then much of World War II and all other previous war experience may well be old hat. But few whose business is fighting wars or preparing for wars will accept this concept. They scarcely can afford the luxury of accepting it, for what would happen should the anticipated fail to materialize? In World War II, for example, the moratorium on gas warfare was not so much for humane reasons as for the very practical matter that neither side could hope to gain particular advantage from it. We must assume at this point in time that so long as there are wars, there will be armies and there will be battlefields. These are two of the constants in war, like man himself. And so long as there are armies and battlefields, then the experiences on other battlefields are important as background, as starting point for planning, as index to what might happen on future battlefields.

An antiquarian approach to military history is not, of course, the answer. How many pieces of fringe hung from the epaulettes of an officer in the Continental Army makes little difference except to uniform collectors and museum curators. But military history generally has an immensely practical side. Principles and methods of leadership. How armies are raised, moved, supplied, maneuvered under varying conditions and situations. The impact of new weapons. Changes and the reasons for changes in tactical doctrine. Concrete illustrations of the principles of war.

Getting full benefit from the study of military history involves the element of projection, translating the events of the past into the possibilities and likelihoods of the future. Take, for example, the experience of the Ardennes, the semi-mountainous region of Belgium and Luxembourg which has been the site of three major campaigns in the last two wars. He who studies these campaigns will be struck with the similarity of experience imposed on the combatants by the nature of the Ardennes terrain, despite differences in weapons, tactics, mode of transportation, even climate. Note how the southwesterly orientation of the roadnet assisted the Germans in 1914 and 1940 yet frustrated them as they tried to move northwestward in 1944. If the defiles and rivers created bottlenecks here and here, will they not exercise similar influence again? Are these spots not likely targets for tactical nuclear weapons, despite innovations like the helicopter, the flying jeep, or large-scale airborne attack?

Or take an example of a larger battlefield, one which has seen constant warfare through the centuries: northern and northeastern France. A study of the terrain will reveal that successive escarpments rise toward the east, each dropping off abruptly to present a relatively sheer face toward the enemy from the east—the Vosges Mountains, the heights of the Moselle and the Langres Plateau, the heights of the Meuse, the "Dry Champagne" Plateau, and the "Ile de France" Plateau. Rivers and a series of high intervening ridges similarly protect the heart of France from the north. In 1814 the Allies overcame these obstacles by employing multiple columns, one from the north, two from the east, so that Napoleon with his limited forces wore himself out racing from one invading column to the other. In 1870 the Germans overcame them by the simple process of outmaneuvering the French. In 1914 they tried to overcome them by surprise achieved through violating Belgian neutrality, but failed. In 1940 they overcame them by a surprise move through the Ardennes and by innovations in weapons and tactics. How can these obstacles be overcome in a future war? Or how can they be utilized by the defender to defeat the intentions of the attacker?

Ah, yes, the colonel says, but who can predict we will fight again in the Ardennes or even in France?

"In peace," wrote Niccolo Machiavelli, soldiers "must learn the nature of the land, how steep the mountains are, how the valleys debouch, where the plains lie, and understand the nature of rivers and swamps. . . . Then by means of the knowledge and experience gained in one locality, one can easily understand any other that it may be necessary to observe; for the hills and valleys, plains and rivers of Tuscany, for instance, have a certain resemblance to those of other provinces, so that from a knowledge of the country in one province one can easily arrive at a knowledge of others."

Action gives meaning to terrain

Refine Machiavelli's point by adding to it a simple device which the novelist uses all the time and you increase the value of the study. If the novelist wants to describe the appearance and character of his hero, he avoids long descriptive passages lest they bore his reader and fail to stick in his mind. He describes his hero by telling what the hero does. Applying the device more closely to a military situation, a reader will not long remember the dominating position of a rise in the ground from a mere description of it, but if an enemy tank sticks its gun over the rise and fires, the existence and the nature of the ground will take on new meaning. It is the same with war. Action when fitted to the terrain gives meaning to the terrain and to the action as well.

This is infinitely better than studying a purely hypothetical situation, for this is history, something which actually happened and may happen in similar form again. History combines ingredients of human behavior, of matériel limitations, of terrain, of the elements in a realistic manner which no author of a hypothetical situation can hope to duplicate.

This is not to say that the historian expects events to follow exactly the same pattern in the future as in the past. The oft-told example of the British general in the Near East during World War I who discovered in his Bible the night before an attack the successful formula which another general of Biblical times had employed to take the same objective is all too rare. What the historian does expect is that by putting the facts of the past on paper in an objective, interpretive manner, he will have preserved the past as a bedrock of vicarious experience upon which the present and the future can build. He further expects that the architects and builders will use vision in executing their task. He knows for a certainty that they cannot exercise true vision unless they understand what has gone before.

But, paraphrases the colonel, we all know that what is past is only *prologue.*

What the colonel fails to recognize is that knowing the prologue is vital to understanding the main acts of the play. Thousands of Americans bought the experience of World War II with lives, blood, and sweat. They bought the experience of campaigns planned and conducted in all parts of the globe, under widely diverse conditions of terrain and climate and in widely different economic, political, and cultural environments. In the jungles of Burma and the Solomons, in the frozen muskeg of Attu and Kiska, in the deserts of North Africa, in the mountains of Italy, in the snows of the Ardennes. They bought also the world's most comprehensive experience in coalition warfare. To ignore these experiences, to dismiss them with the glib assertion that they are old hat is an extravagance this nation cannot afford.

Will there be no amphibious attacks in the future? The history of World War II is replete with them. Will there be no airborne attacks in the future? With one minor exception in Korea, World War II contains all the world's airborne combat experience. Will men not have to be fed in the future? The U. S. Army gained a lot of experience in feeding 7 million people in Europe alone during World War II.

Not all experience is confined to battlefields

It is true that today we have an accumulation of personal wartime experience among the persons occupying high places in our army. But how long will this last? In the European Theater in World War II few generals in command of corps, armies, or higher had had any significant combat experience prior to World War II, yet World War I had ended only 26 years before. Furthermore, how much of war can one man learn by personal experience alone? Officers in Korea whose World War II experience had been confined to Europe were slow to recognize the importance of the simple tactic of perimeter defense, something their Pacific-trained colleagues considered second nature. The French theorist, Ardant du Picq, has written: "Experience is long and life is short. Therefore, the experiences of each cannot be completed except by those of others."

Nor was all our valuable World War II experience confined to the battlefield or even to the overseas theaters. We also had a home front which encountered various problems of incredible magnitude and which reached solutions—not always the best ones—only after considerable and often costly experimentation.

How old hat is this experience?

A friend of the colonel's, an eminent consultant employed indirectly by the Department of Defense, told a high-powered seminar in 1959 that the experience of World War II in the field of economic mobilization is of no use to planners today. The technological strides, he said, have been too great. Then he named a dozen allegedly new problems of economic mobilization likely to be encountered in another major war.

The colonel's friend does not know that most of the anticipated problems were, in fact, experienced in similar form by the United States during World War II and that the efforts made to solve them had been described in considerable detail in *The Army and Economic Mobilization*, a published volume in the Army's official history of the war.

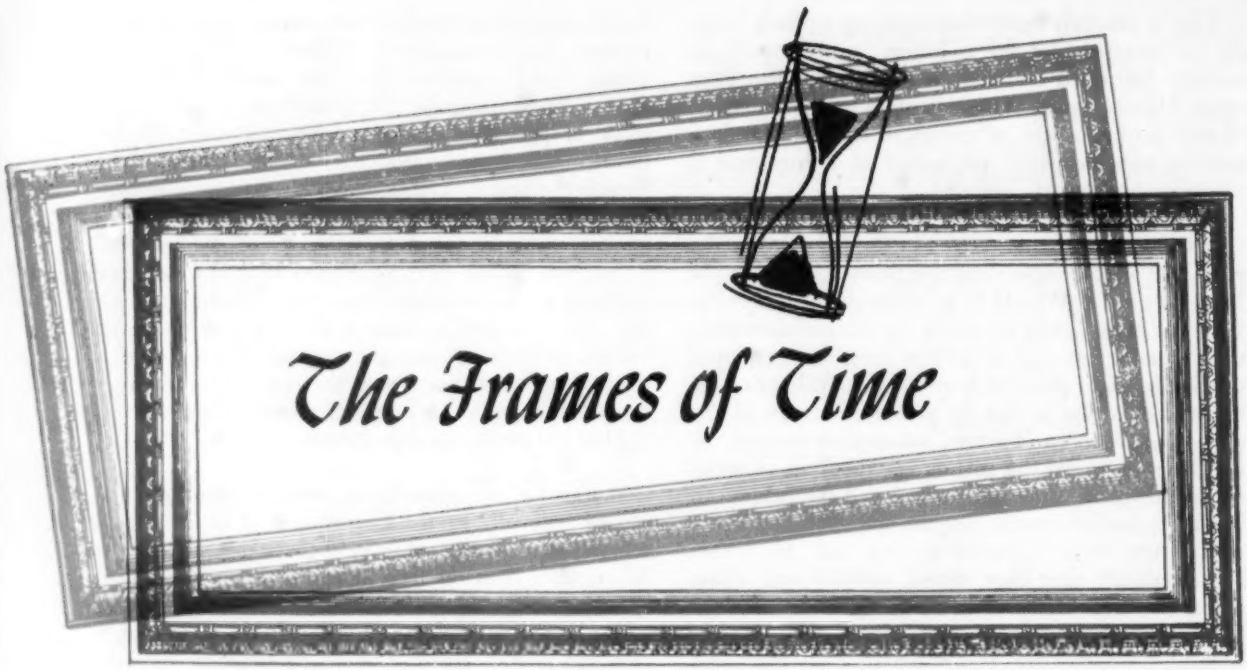
Just over half of a planned 80-odd volumes in the Army's official history have been published, while a number of other volumes are either in press or nearing completion. For the first time the U. S. Army will have a detailed narrative account of its failures, its fumblings, its experiments, its successes, its accomplishments. Without support in high places, this history could not have been written.

But what is the point of it, asks the colonel, if the officers who are expected to learn from it do not read it because they look on World War II as old hat?

"In history," writes Captain B. H. Liddell Hart, "we have bottled experience, from all the best growths, only waiting to be uncorked." Yet if we ignore the past, who will uncork the bottle?

Either we have seen the end of war—an assumption too dangerous to endorse—or World War II (plus Korea) was the prologue to future war. We must, of course, remain alive to the danger of fighting the next war in terms of the last. We must also remain alive to the danger of misinterpreting the past.

We cannot afford to ignore the past, Colonel. As Santayana put it: "He who ignores history is condemned to relive it."



From the R&D paintbrush, a portrait of future hardware for the Army

Major PATRICK W. POWERS

IN August of the same year that Columbus started his summer cruise to what is now known as Cuba, trouble was brewing back in the old country in the City of Florence. Lorenzo the Magnificent, the local ruler, statesman, and art patron, was experiencing a "vest pocket" revolution of his own by the rival factions of the two greatest painters of that time. Before anarchy became rampant, Lorenzo knew he had to make a hard, but fair, decision as to who should hold down the number one spot in painting.

"Now look, you two," he admonished the two artists, "one of you has got to go before all hell breaks loose around here. Just to settle this thing, once and for all, we're going to have a contest. The winner will go down in history as the best all-around painter of these modern times with a prize of 1,000 florins, to boot. The loser can take the first boat for the Indies and stay there!"

"Here are the rules," he continued. "A friend of mine from the mountains to the north is coming down for a short state visit. I want you both to paint his portrait *before he gets here*, and the most accurate and realistic likeness will determine the winner. Now I know you've never seen this man before so I'll give you a few facts and clues about his features and leave the rest up to your abilities and imagination."

With that, he locked them up in separate towers with all of the equipment they needed and let them have free rein, so to speak. It was a tough mission for these two craftsmen.

They worked hard, sketching some of their ideas and rejecting others. They mixed their pigments carefully on the palettes and gradually constructed the portraits on canvas, paying attention to the right perspective, to detail, to highlights, and to shadows.

The day of reckoning arrived in a few months when the paintings were unveiled in the presence of the distinguished visitor, Lorenzo and his court, and the worried artists. A great cry of astonishment came from the lips of the visitor as he saw his likeness mirrored in Michelangelo's magnificent painting. The loser, whom we shall leave nameless, left immediately for the high seas.

More than Art triumphed that day. Imagination and the boldness to transform it into a realistic picture based on facts and ideas, and the ability of a great painter determined the outcome of the contest.

The future has captivated mankind for thousands of years and today we are concerned about it more than ever. From the "futures" of the stock

---

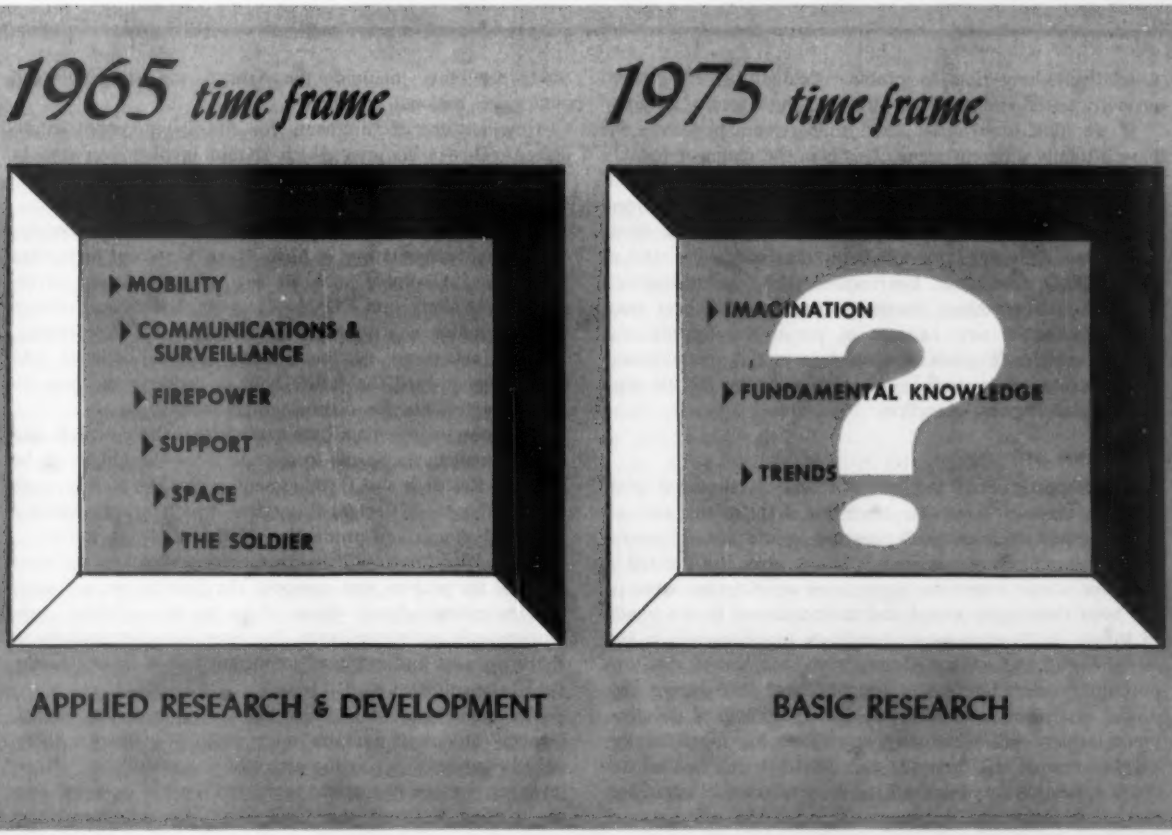
Major Patrick W. Powers, Artillery, is on duty in the office of the Army's Chief of Research and Development. A frequent contributor, his latest article was "No Time for Sale" in the March 1959 issue.

market to the outcome of the international controversies over Berlin, nuclear weapons, the Middle East and Quemoy, we wonder how it will affect us individually and as a nation. The Army is vitally interested in the future and what the conditions will be on tomorrow's battlefields. Like those ancient artists of Florence, the Army must be able to "paint" accurately and realistically the portrait of the future. If the time should ever come for an unveiling of combat forces, the "likeness" produced must be the best one to accomplish the mission.

The weapons and matériel for the future Army are being designed and developed *now* through a research and development program that reaches into every possible phase of combat from electronic microminiaturization to missiles, from GOERs to bone "glue." Over 10 per cent of the Army's budget is spent on this program and the importance of the effort should be realized by every soldier. The purpose of this article is to show what is being done about the Army's future—your future—and what weapons and equipment you can expect in the time frames of 1965 and 1975.

Why were these particular "frames of time" chosen for a portrait of the future? Because they represent today's approximate cutoff dates for applied research and development and for basic research. For instance, the weapons and equipment that we will see in 1965 are beyond the drawing board stage. As a result, they can be evaluated as hardware or production items. We know what they will be like because the components exist and, in most cases, are undergoing early testing. In other words, in the applied research and development time frame there will probably be no items of equipment that will revolutionize the battlefield. Thus, we can visualize a rather accurate picture of conditions during that period because we know the nature and capabilities of the machines of war that will appear. As an example, one of the many flying platforms that the Army is developing now will be available to give the "Sky Cavalry" real mobility about the battlefield in 1965.

It might be well to emphasize *why* this equipment won't be operational at an earlier date than 1965. The average lead time of weapon development from the conception of an idea to the issue of the finished product by the supply sergeant is about six to nine years. This lead time involves constructing prototype weapons, testing, contracting with industry, funding, production, and engineer-user testing before the final item becomes operational. It takes



artist's conception of a flying platform . . .

. . . convertiplane concepts—aircraft that take off

IN THE AIR, MOBILITY WILL TAKE

a relatively long time to produce fieldworthy equipment, properly tested and ready to withstand the rigors of combat.

If we look toward the 1975 time frame, however, we have a totally different scene. This is in the realm of today's basic research which takes 12 to 20 years before it is usable for weapon development. Here imagination projected from the fundamental scientific discoveries of today and from those potentially available tomorrow determines the strokes of our R&D paintbrush. For instance the "thermoelectric" principle that produces electricity directly from heat may provide a whole new concept of propulsion for air and ground vehicles. Engines developed from this phenomenon would result in an astonishing reduction in the logistic support needed for any operation.

R&D gets priority

The importance of the research and development program is obvious when we trace the tremendous rate of scientific and technological progress in the last 25 years. The surge of new developments since 1945 has created a situation where a weapon approaches obsoleteness when it has been thoroughly tested and is operational in the hands of troops. A close analysis of military developments in the Free World and in the Communist bloc shows that important "battles" are being fought right now during this period of tension with scientific and technological developments which will eventually determine the input to the weapon arsenal. Neither side can afford to fall behind because a weapon breakthrough could produce the advantage that might tempt an aggressor. That is why our national R&D programs, including the Army's, are being enlarged and given national priorities.

How are the requirements for future equipment established? This is an area which should involve everyone in the Army. First, the enemy threat for a particular time frame is predicted. This may be numbers of ground forces, types and ranges of missiles, and the weapons and equipment that we expect him to have. Next, a concept of tactical operations to combat such an enemy is developed. Overseas forces along with CONARC troops, boards and schools make valuable contributions in this area to DA planning. Finally, extensions of the present state of science and technology toward the future help to estimate the new dimensions feasible for combat equipment.

Once the requirements are established, the research and development cycle begins to operate from the Office of the Chief of Research and Development on the DA staff through one of the seven technical services which are responsible for development and production of the hardware items.

In the 1965 "portrait" we can recognize about six different parts of the picture that compose the likeness we are seeking. A critical glance shows them to be mobility, communications and surveillance, firepower, support equipment, space projects and the most important factor on any battlefield—the soldier.

The importance of mobility has always been recognized. General Stonewall Jackson once said, "To move swiftly, strike vigorously . . . is the secret of successful war." Now, however, we see movement increased tenfold or more over the closing days of the Civil War, one hundred years

vertically, then "convert" to conventional flight . . .

flying cranes that will lift tremendous loads . . .

ON A DYNAMIC NEW MEANING

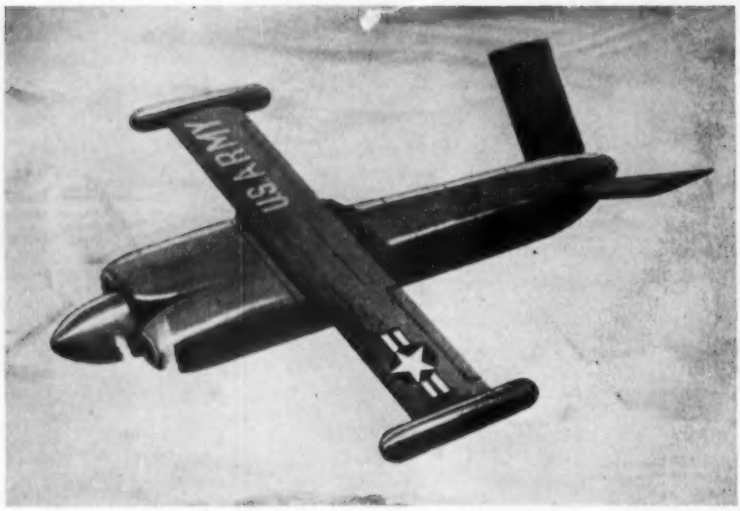
ago. Small, lightweight, armored personnel carriers cover the terrain and move easily across water barriers. Real off-road mobility is incorporated into the GOER vehicles with tires 10 feet high that cross anything from swamps to sand and snow. Each wheel is individually driven by an electric motor that gets its power from a generator driven by a multifuel engine. A series of such vehicles can be made into a "train" which might have a small atomic reactor as the source of power. Tanks and conventional trucks will benefit from new pressure-ignition or diesel engines and multifuel types for lower fuel consumption. Incorporation of gas turbines will eliminate cold starts and provide smooth power application over a wide range of requirements. As a matter of fact, one of the oldest forms of power known to man—the steam engine—is seriously being considered in its modern form of the vapor cycle engine. This development utilizes the normal hydrocarbon fuels for heating water to steam to drive pistons and turbines that furnish power to the wheels or tracks.

In the air, mobility takes on a dynamic new meaning. Within the battle area are a complete family of air vehicles from conventional aircraft to better helicopters and flying platforms. Now we see armed reconnaissance assume a dominant role with air vehicles that take off and land like a helicopter and possess the forward speeds and maneuverability of conventional aircraft. The armament for these vehicles consists of everything from machine guns, rockets, and missiles, to low yield atomic weapons. Logistical support is better served with cargo aircraft like the Caribou and helicopters such as the Chinook for both troops and supplies. With this increase of air vehicles, the air space above the battle area is a busy place because even the "little" war has become truly three dimensional.

Communications Speed-up

The second area of interest covers the rapidly expanding communications, electronics, and surveillance aspects of our 1965 time frame. Since we can see that there is more movement and less reaction time on this battlefield, then more information must be collected and evaluated rapidly so that the commander can make a timely decision. The enemy will undoubtedly be maintaining the same sort of pace and we must be able to trace his movements and locate profitable targets which will be fleeting in nature compared to past conflicts.

To speed up the flow of information from the lowest units, a telephone type dialing system will make contact with any other unit or headquarters. Contact is made through a combination of telephone and radio relays. Essential information is converted into digital form and processed by an automatic data processing system which eventually feeds the bits and pieces to electronic computers for display to operations personnel and the commander. Thus the flow of combat information is accelerated by eliminating cumbersome processing by hand, and important information is available for recall from punched card and memory equipment. The name of this system is the Universal Integrated Communication (UNICOM) System, an advanced step from the Area Communication system of today. Without such a system, the battles of the future would become



Advances in Surveillance and Communications

reconnaissance drone will use infrared radar and photographic devices

micro-modules the size of a lump of sugar suggest degree of miniaturization now possible

hopelessly entangled by too much information, too late.

Recent advances in electronics have made this system possible as well as reducing the combat load of communications equipment, increasing reliability and lowering maintenance requirements. Radios are deceptively small yet have longer ranges with increased channel coverage from 80 to 800 usable frequencies. Miniaturization and microminiaturization of electronic parts allow 70,000 parts to be placed into a cubic foot of space. Many of the basic portions of a transistorized circuit are placed on a plastic block only 1/20th of an inch wide and 1/100th of an inch thick. The combat equipment of this time frame will be able to carry more complete communications for better control of the fluid and dispersed battlefield.

Drones to play key part

If we look closely at our big picture, we can see a multitude of surveillance devices which provide better eyes and ears for the commander. Penetrating hundreds of miles into enemy territory are aircraft drones that record enemy activity or locate important targets. This is done by means of radar, infrared, television, and photography. The information obtained is relayed back to a waiting ground station or is dropped over the processing center as the drone returns from its mission. Of course, direct observation is also used by manned air vehicles such as the Mohawk with speeds of 200 knots and means to carry the same sensory devices as the drones. On the ground, versions of the airborne equipment can be emplaced to present a relatively short range survey of the battle area.

The most spectacular aspects of this future battlefield are the firepower means employed against the enemy. The spectrum ranges from small arms through low yield atomic weapons to an integrated family of tactical missiles. Actually, there are no radical weapons—such as "death rays"—to revolutionize the art of war, but future weapons used will be more lethal, lighter, more reliable and will require less maintenance than the weapons of today. The combat operations will be so fast and decisive that the soldier must have improved, less complicated weapons to accomplish his mission.

Small arms will use multiple and higher velocity bullets which give an improved assurance of lethality. Rifles and machine guns are lighter and carry more rounds in their magazines. Tube artillery still provides the close-in fires as always but each weapon, like the moritzer, has a greater range coverage, more destructive power and can be moved readily in aerial vehicles. A family of missiles gives complete fire support coverage from the forward edge of the battle area to hundreds of miles into enemy held terrain. Antitank protection is afforded by homing type missiles and rockets fired from the ground or from air vehicles. Low yield, portable atomic weapon launchers which can be mounted on any ground or aerial platform or emplaced with the most forward units will allow the infantry commander to attack profitable targets when they present themselves. This is consistent with the concept that small units will be dispersed and yet be able to control independently large areas with this type of weapon. Finally, air defense weapons will range from the shoulder-fired Redeye missile to the mobile, improved Hawk system.

One of the most talked about means of firepower—chemicals—may have come into their own by this time. Here is a means to gain an objective by the use of incapacitating gases which do not kill but leave the enemy helpless for controlled lengths of time while our forces capture the site. Important man-made objects such as bridges and buildings are left undamaged for our own use, while enemy troops are captured without firing a shot, substantially reducing our own casualty rate. Although not normally considered a weapon, incapacitating chemicals do have important military applications on any battlefield.

Logistical support of the 1965 battlefield has received the emphasis it deserves. This is reflected in the special equipment funneled into the combat area from the lifeline of supplies back in the administrative zone. Fuels move forward in pipelines or bulk fuel transporters to the army areas and then in rolling fluid transporters for unit distribution to individual vehicles. Bulk loads are palletized and placed into containers for transfer from ship to trailer to truck for faster utilization. Transport aerial vehicles shuttle back and forth with critical supplies from small depots scattered in the Army areas. The supply system is tied together by automatic data processing equipment that allows requisitions to be filled in a fraction of the 1959 time. Small, fast cargo ships with roll-on-roll-off trailer loads

or metal box containers, or both, are emptied by quickly constructed floating causeways and aerial tramways, which take the loads many miles inland. The entire operation is monitored and controlled through a communications network much like the Unicom system already described.

Now take a look at that big third dimension in the picture. The space around our planet seems crowded, comparatively speaking, with satellites performing many critical missions for the troops on the ground. No, there are no space platforms with earthmen controlling the world like puppets on a string; and there are no forces on the moon fighting it out for control of the high ground. But there *are* communication relays by means of the satellites that permit reliable, world-wide contact among our forces. No longer will long-range communications fail because of weather and terrain: there is a stationary satellite above every important area on earth that can relay those vital messages. In addition, the commander will have more confidence in the weather because satellite forecasts will be amazingly accurate; he will also have an accurate picture about enemy buildups and movements and about the launching of missile attacks.

Of course, there will be some advance equipment on the moon but no humans. This equipment will provide a better estimate of celestial activity, both friendly and enemy, as well as providing more information about the environment on the moon. The Army will continue to look toward space, the moon, and in any other direction that will assist in performing its missions on earth.

Now what about the soldier of 1965? For one thing, he will be more highly trained for the complex equipment and weapons that are on the inventory of that future time frame. In fact, the front-line infantryman will know how to fire a variety of unusual weapons from the new small arms to the low yield atomic weapons. If he should be part of the crew in an aerial vehicle, his training will be even broader because he must also know the same fundamentals of ground combat that enabled his predecessors to accomplish the same type of mission.

All-weather clothing

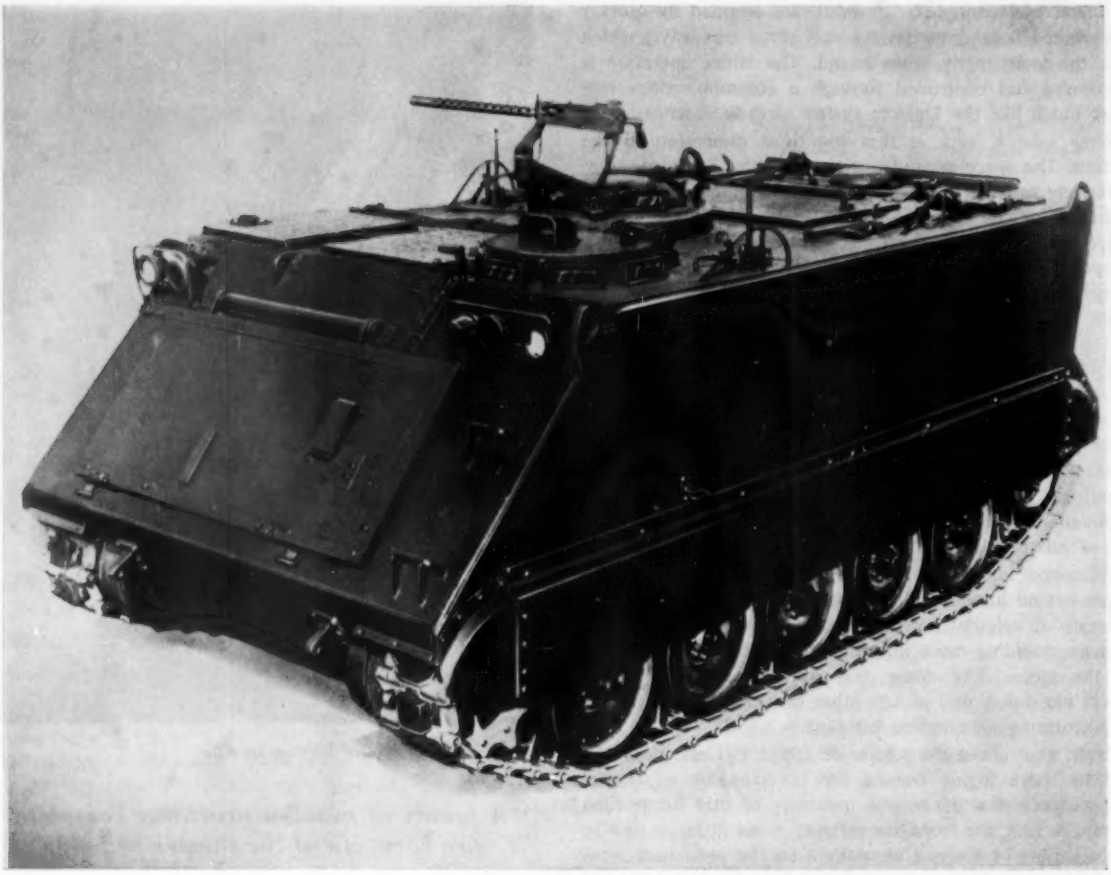
There are some important differences, however. The soldier has been given greater protection from the climate and from the usual effects of any battlefield. His clothing is lightweight, yet the same garment protects him from extremes of both hot and cold weather, wet or dry. Electrical wiring in his battle suit and a small pocket battery provide heat while built-in body armor offers protection from small arms fire and penetration by shell fragments. His food will be so processed that the addition of hot water will provide a really good meal. Refrigeration may be virtually eliminated so that fresh steak and chicken can be carried for many months, ready for cooking at any time. If he becomes a casualty because of a broken bone, the Medical Corps has a bone glue that cements the ends of the break together or substitutes for a missing segment. With this treatment he will be up and walking inside of 48 hours!

The soldier of 1965 will also be better adjusted, mentally and physically, to the rigors of the times. R&D in the social sciences has uncovered some of the unknowns of human behavior under the stress of combat. This new knowledge has been utilized in training to enable the soldier to react properly and in a predictable manner to the multitude

Hawk—surface-to-air defense missile

A family of missiles providing complete fire coverage of the theater of battle

Sergeant—surface-to-surface missile



The M-113 armored personnel carrier is today's herald of new ground vehicles, for combat and support, that are coming

Rolling fluid transporter—gigantic tires carrying hundreds of gallons of gasoline suggest revolution in POL deliveries

New patterns in ground mobility

of complicated situations that present themselves in rapid succession. The soldier's equipment and weapons are designed to be compatible with his capabilities so that he always remains the master of the machine. We can see that the man on the ground—or close to the ground—is still the final arbiter of any action in this future environment. He is still required in great numbers in spite of the automation. In this respect, General Ridgway's words still ring true: "Man is the dominant factor in war."

If we turn our attention now to the time frame of 1975, we find that our portrait is not sharply defined, for the haze of speculation hangs over the battlefield. We do have some basis for predictions, however. First, there will be more people on this planet than ever before—over three billion. This is a threefold increase since the birth of the United States Army, two centuries before. The result is obvious: more potential areas of conflict, more jobs for the ground soldier, more ground soldiers required. Another sobering fact: the "Oxcart Theory" still holds. There are more oxcarts in this world than automobiles. The net effect is that while science and technology produce fantastic advances, the bulk of the inhabitants of this planet live the same way their ancestors did; and this is an important part of any future environment, affecting any type of ground conflict.

NEW SONAR SIGNAL PROCESSOR DOES WORK OF 1,000 UNITS

The first sonar signal processors to utilize time compression are being produced by General Electric. These new processors were developed in cooperation with the United States Navy. Extracting only critical bits of transmitted and received signals in series, one unit can perform as many correlating operations on a continuous signal—in the same time—as a parallel processor with thousands of units.

Excellent improvement in signal-to-noise ratio also makes these new processors effective against background levels which have formerly made certain signals undetectable by any other practical means. The new equipment is also designed to handle signals from more than one transducer.

This advance in sonar signal processing is typical of General Electric's many achievements in defense electronics. 227-3

Progress Is Our Most Important Product

GENERAL ELECTRIC

DEFENSE ELECTRONICS DIVISION • HEAVY MILITARY ELECTRONICS DEPT. • SYRACUSE, N. Y.

The second factor that contributes to the likeness of this time portrait is an awareness of the discoveries resulting from basic research or the extension of scientific knowledge. Much of this new knowledge of our universe was discovered within the last decade, especially in the last few years.

The thermoelectric engine, already mentioned, is one example in addition to the forging of new metal alloys under extremes of temperatures and pressures. This type of research has resulted in metallic "whiskers" that have tensile strengths more than 6 times that of steel and in metals which can withstand temperatures of over 5,000 degrees Fahrenheit for an appreciable time. The air cushion principle that allows a vehicle to fly close to the ground while requiring a minimum of power is the "greatest thing since the wheel" and will replace it in many cases. These and thousands of other advances provide an insight into the picture of 1975.

While we are able to predict, with ample imagination, what some of the possible machines of war will be like in this period, we can also estimate the enemy threat and what our tactics must be to counter it. Actually, this is the kind of a lead time that permits the military planner to outline to the scientist and the engineer the characteristics of the weapons he needs. Then technology takes over and, in theory, the hardware rolls off the assembly line in time to be operational in the field against the predicted threat. A measured and sustained scientific effort is always necessary to do this. Of course, sudden and meaningful discoveries and inventions change the course of weapons development but the present R&D program is geared to take advantage of such innovations.

If we take a step closer to the 1975 portrait of the Army, there appears to be an astonishing movement—almost a random motion, like tadpoles in a pan of hot water—about the combat landscape. Vehicles seem to skim over the surface of the ground, land, and speed down a road, and then take off into the air again. The battle ebbs and flows in quick succession as a creeping curtain of slower vehicles and men edges forward. Make no mistake about it: there may be more mechanical machines in evidence, but there are also more men. The Free World's resources in men have definitely increased and when it comes to controlling the land, there is no substitute for manpower.

Casualties from unknown sources

Bursts of weapon fire appear in the usual frequency but casualties of enemy troops are also noted from unknown sources. Could this be from psychochemicals or from invisible "death rays"? Our experience today in certain fields makes this appear feasible. Another observation: since casualties seem to recover rather rapidly, it is assumed that the Medical Corps has reduced with simple pills and injections the effects from atomic, chemical, and biological weapons and the ever-present "battle fatigue."

A curious omission in the battle area is the lack of supply points, especially of fuel and ammunition facilities. Perhaps man has learned to harness new forms of energy by this time to propel his ground and air vehicles so that the tonnages of fuel required for a combat theater have been reduced from the present two-thirds of all supplies sent overseas to an insignificant amount. We know today that energy from the sun, cosmic rays, the atom, and from sources of electromagnetic radiation can all be used for power. These sources of energy have led us away from the bulky, heavy, voracious fossil-fueled engines of today. This is perhaps the most significant blessing in disguise since the discovery of fire (and they said it couldn't be done!).

Closer examination of our canvas with a magnifying glass shows the well-protected "super trooper" of 1975 using his wrist communicator to good advantage. This gadget has a small telephone dial for reaching any other soldier in the local area or, for that matter, in many places of the world. The small, postage stamp size television screen gives a view of his contact or lets his commander see what is going on around the soldier. The soldier's first sergeant has a pocket electronic computer to tabulate the morning report statistics and pass on other pertinent data to the operations and supply officers who also have similar equipment. This constant flow of information is processed in seconds up and down the chain of command by this type of equipment so that the commander has a readily available source of up-to-date information on which to base his decisions. Decisions which must be made as rapidly as the startling mobility of his units.

The Army of 1975 has been deliberately painted with broad brush strokes to illustrate an important point: imagination plus known facts and anticipated scientific and technological trends is the key to the successful design of tomorrow's weapons and equipment. The Army is taking the necessary steps now to seek more fundamental scientific knowledge through its basic research program that investigates 10 major scientific fields and 74 sub-fields. These include physics, biology, medicine, chemistry, mathematics, and the social sciences. Nearly 2,400 research tasks are studied by Army laboratories and by about 400 colleges, universities, non-profit institutions, and other outside contractors. Part of this program is conducted in 14 countries. Imagination for the application of this kind of knowledge comes from any direction: the scientist, the engineer, or the soldier.

There is a real and urgent role for every soldier today in developing this matériel. First, he should take an active interest in thinking about the future missions of the Army, envisioning what the environment will be like. Next, he can start the requirements coming in from the field on ideas for needed equipment, weapons and matériel, regardless of their present feasibility. Progress is always based on ideas and the geometric progression of technology today needs more ideas to harness the results of research and development. Third, he could seek participation in the research and development field to assist in the formulation of the Army in the "frames of time."

Today the Army, like the artist, must step back from the canvas of the future and gain perspective by sighting along the paintbrush of its predicted national missions. Then comes the blending of the three primary colors of Time, Tactics, and Technology on the palette of research and development. With an aggressive and enthusiastic style, the features of the portrait can be completed for an effective and realistic likeness.

In the expanding international role of the United States, the Army soldier will continue to be strong evidence of our determination to carry out national policies. The objectives of the research and development program are to provide him with the most effective weapons and equipment to carry out his future missions in any time frame, anywhere on this planet—or even in space, if need be.

THE NEW U.S. ARMY SAVES LIVES

and there's a BELL in the Picture

For the combat unit in the Atomic Age, the increased fire-power of modern armies has its grim corollary — the possibility of increased casualties. But, to save lives, Army Aviation brings to today's modern Army aero-medical evacuation — the utilization of air vehicles for battlefield pickup of casualties. As early as the Korean War, Bell helicopters pioneered this concept of recovering the seriously wounded. Of all front line wounded U. N. troops rescued by helicopters, the Bells were credited with evacuating 80% of them (an estimated 18,000). Bell is privileged to be on the new Army's team — and for its role in helping provide the extra margin of mobility that may mean the difference between life or death on the battlefields of tomorrow.

FORT WORTH, TEXAS
SUBSIDIARY OF
BELL AIRCRAFT CORPORATION

BELL
HELICOPTER CORP.

*

To combat the complexities of modern warfare and preserve our freedom, the U. S. Army must remain the most modern and most versatile army in the world . .

BELL

is telling the nation of this need and how well today's NEW U.S. Army is meeting the challenge.

**One of a series of ads currently appearing in such opinion-making publications as Fortune, Business Week and U. S. News & World Report.*

FORT WORTH, TEXAS | SUBSIDIARY OF BELL AIRCRAFT CORPORATION

BELL
HELICOPTER CORP.

THE CARE AND FEEDING OF INNOVATORS

Lieutenant Colonel CHARLES F. AUSTIN

Change is an unceasing fact of life and the commander who can establish a healthy "climate of creativity" within his organization will master change instead of being mastered by it

THERE are many different ways to approach command, management and leadership. The conventional military approach has been to set forth rules and principles, primarily in *positive* terms, such as, "Staffs may approve but may not disapprove a line proposal." The value of this approach has often been questioned.

An approach to the study of management which has been found to be quite useful by the faculty and participants at the United States Army Management School is to divide all management functions into two categories: functions of management, and functions of the manager. The first consists of incremental functions which take place within the organization. These are planning, organizing, directing, coordinating, and controlling. The second consists of *personal* functions performed by the head of the organization as he uses his *individual* capabilities to insure that the *organizational* functions are carried out: establishing objectives, motivation, communication, innovation, decision-making, and maintaining a cooperative system.

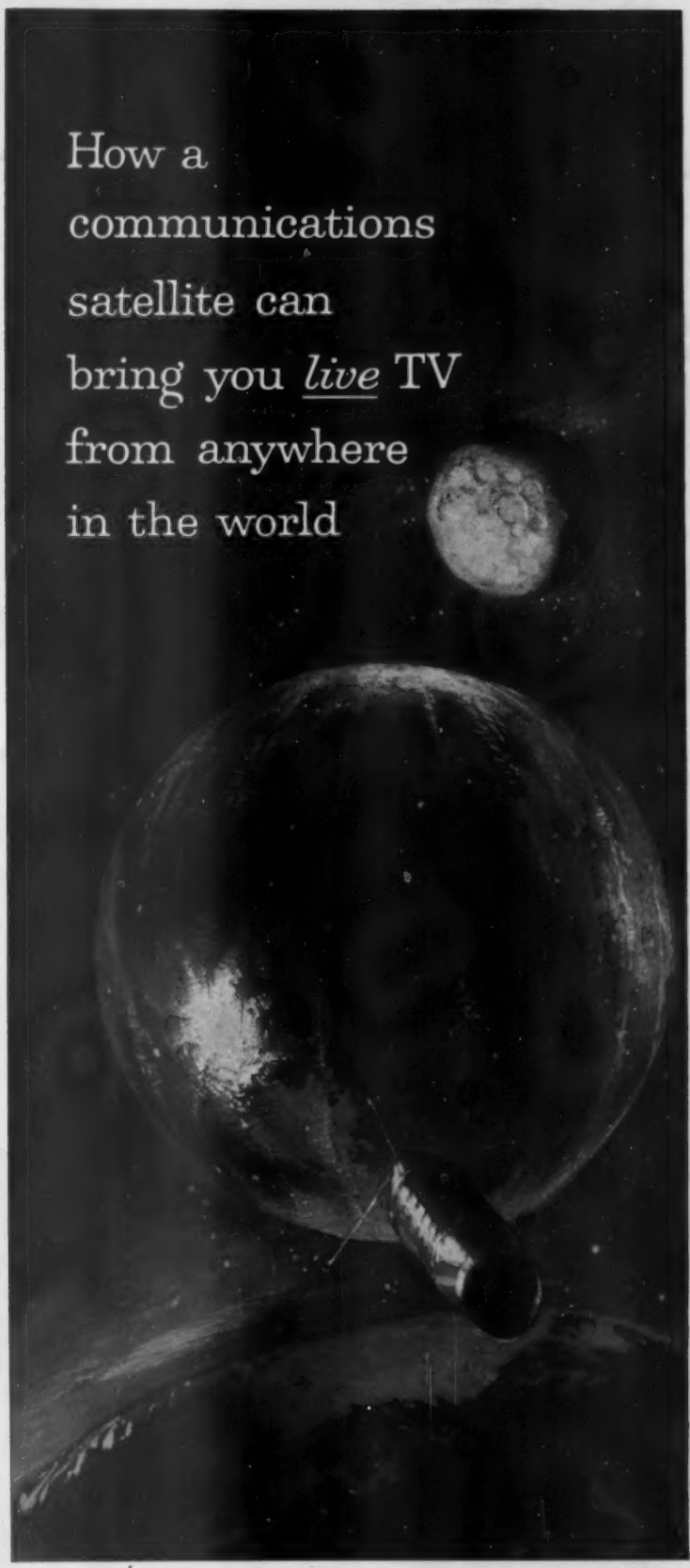
A vitally important personal function of the individual manager is that of "innovation." There is some variation in definitions of the word, but all have a connotation of the new and different; new or changed methods, customs, devices, and so on. All involve the element of "change." Without specifically defining the word, it can be stated that innovation embraces all acts of omission and of commission which cause a "climate of creativity" within a unit, a climate which encourages the offering and support of new ideas, especially drastically new ones, until they are either adopted or proved, beyond any reasonable doubt, to be not useful.

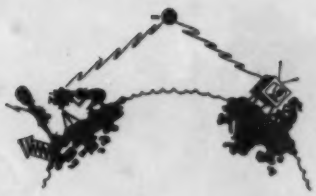
In these days of technological change, one important thing is changeless: There will never be enough *Army* dollars or enough *Army* personnel, military and civilian, to do the Army's job. This is a fact of life we must face. So our Army managers must perform the continuing task of the allocation of *shortages*, which is far more difficult than the allocation of *resources*, although they are of course similar functions. At the same time that the Army budget is not increasing, the size and cost of the job to be done *is* increasing. In other words, the individual Army manager and his organizational element must do the same or a bigger job with fewer resources. They must find simpler, easier, more economical ways of accomplishing their missions. One thing which will help the manager succeed is *innovation*.

The keynote word in any definition of innovation is "change," and that very word with all it connotes, is the greatest single barrier or impediment the Army manager faces as he tries to create the organizational climate we have referred to. Human beings are creatures of habit and as such they are typically not receptive to change. Further, change is often perceived as a threat to such important individual values as personal or economic security, existing desirable personal relationships, and the like. The nature of resistance to change is perhaps generally recognized by the Army manager.

(Continued on Page 42)

Lieutenant Colonel Charles F. Austin, Finance Corps, is on the faculty of the Army Management School. He is a graduate of several service schools and of the Harvard Graduate School of Business Administration, where he is a full candidate for the degree of Doctor of Business Administration. Colonel Austin wrote "Management's Self-Inflicted Wounds" in our April 1959 issue.





World-wide live TV, with no cable or radio relay costs, can develop from outer-space research by government and industry

Among the peaceful applications for scientific break-throughs being made in the study of outer space is a communications satellite.

Using inflated plastic satellites, boosted toward orbit by the Air Force *Thor* rocket, a global TV network could be established. TV signals would bounce to satellite and back to your station, giving you a front-row seat at events anywhere in the world. Cost should be a fraction of coaxial cables and microwave relays now used.

Practicality of *Thor* for this purpose is based on its demonstrated reliability. With Douglas responsible for airframe fabrication and assembly and test of the entire system, *Thor* has helped launch 84% of all payload weight put into space by the U. S.; is the key booster in the Air Force "Discoverer" firings; launched the first nose cone recovered at ICBM range.

Thor is another product of the imagination, experience and skills which Douglas has gained in nearly 20 years of missile development.

Foil-covered satellite, folded like a pocket raincoat, would balloon out in orbit as an inexpensive TV relay station

DOUGLAS

Builders of the DC-8 Jetliner

MISSILE AND SPACE SYSTEMS • MILITARY AIRCRAFT • TRANSPORT AIRCRAFT • AIRCOMB • GROUND SUPPORT EQUIPMENT

US ARMY
ARMY

GET UP AND GO

for a Pentomic Army

In the flexible, fast-moving battle groups of the Pentomic Army AIR MOBILITY plays a dramatic and vital role. Landing tactical forces, evacuating wounded, reconnoitering, observing, hauling supplies . . . these and other vital combat operations can be handled more swiftly and efficiently than ever before with *aircraft.*

Lycoming is a member of the Pentomic team, too. Lycoming gas turbine and reciprocating engines power more types of Army aircraft than those of any other manufacturer.

Ranging from fixed wing to VTOL, from helicopters to drones . . . today's arsenal of Lycoming-powered aerial vehicles includes:

- Aero L-26 Commander
- Aerojet-Downey SD-2 Drone
- Beech L-23D Seminole
- Beech L-23F
- Bell H-13H Sioux
- Bell HU-1A Iroquois
- Bell YHU-1B
- Brantly YHO-3
- Doak VZ-4 VTOL
- Grumman AO-1 Mohawk
- Hiller H23-D Raven
- Hughes YHO-2
- Ryan VZ-3 Vertiplane
- Vertol VZ-2 Tiltwing
- Vertol YHC-1B Chinook

Lycoming

A Division of **Avco** Corporation
Stratford, Conn., Williamsport, Pa.

(Continued from Page 38)

In any event, it will not be discussed in detail here. One caution must be observed, however. It can be argued rather convincingly (but blindly) that the commander or manager need not concern himself with change; that all he need do is "order a change and it will be carried out." Another (and even more undesirable) way of stating it is that "military authority should be used as a substitute for leadership, or as a crutch by the deficient leader." Nothing is farther from the truth, and the military commander (manager) who conducts himself in this manner cannot expect effective, efficient operation by his unit. Experience and research have conclusively proved the sad fallacy of this type of personal mis-management.

How to foster innovation

We can now ask how innovation is to be brought about, and how to create an organizational climate which will foster it and make it grow. Speaking from within an organizational element, two sources of change are generally recognized: from higher authority, and from within the unit. Let's discuss the former kind first.

Change instituted or directed by higher authority is different in some respects from that generated from within. For example, the directed change is a thing in being. It exists. Usually the Army manager upon whose organization the change is imposed does not have the choice of accepting or declining it. He must accept the directed change and he and his staff must do whatever is required to get the job done. But this paragraph may be read as a disarming thing. It is not! Here is where a high level of managerial skill is demanded of the Army manager. How does he proceed?

At this point the Army manager is the "critical variable" in his unit. His actions and attitudes will largely determine whether the change is truly instituted as intended, or is regarded as a paper exercise. If he supports the implementation wholeheartedly, his subordinates will probably do the same. He is responsible, however, for insuring that the change and all about it, including the need for it locally and by higher headquarters, is explained to and understood by everyone. He has an additional responsibility: After the change has been in effect long enough for it to be validly evaluated, he should appraise it and report his findings to the next higher headquarters or organizational element. In doing this he has discharged a responsibility to himself and to his people, and to the larger organization of which his element is a part.

The second kind of change is that generated from within, which more closely approaches the full definition of innovation. It is this type of innovation which can exist only in the organizational "climate for creativity" we mentioned earlier. The question is: What can be done by the Army manager to create such a climate? The answer is not only not readily apparent; there is no *one* answer or *group* of answers.

One thing is clear, however: the Army manager *must* communicate to every person in his unit that he (the manager) values the opinions and ideas of each, and that it is his earnest and sincere desire that he (the subordinate) make his ideas and opinions known to him (the manager) *and* to his unit.

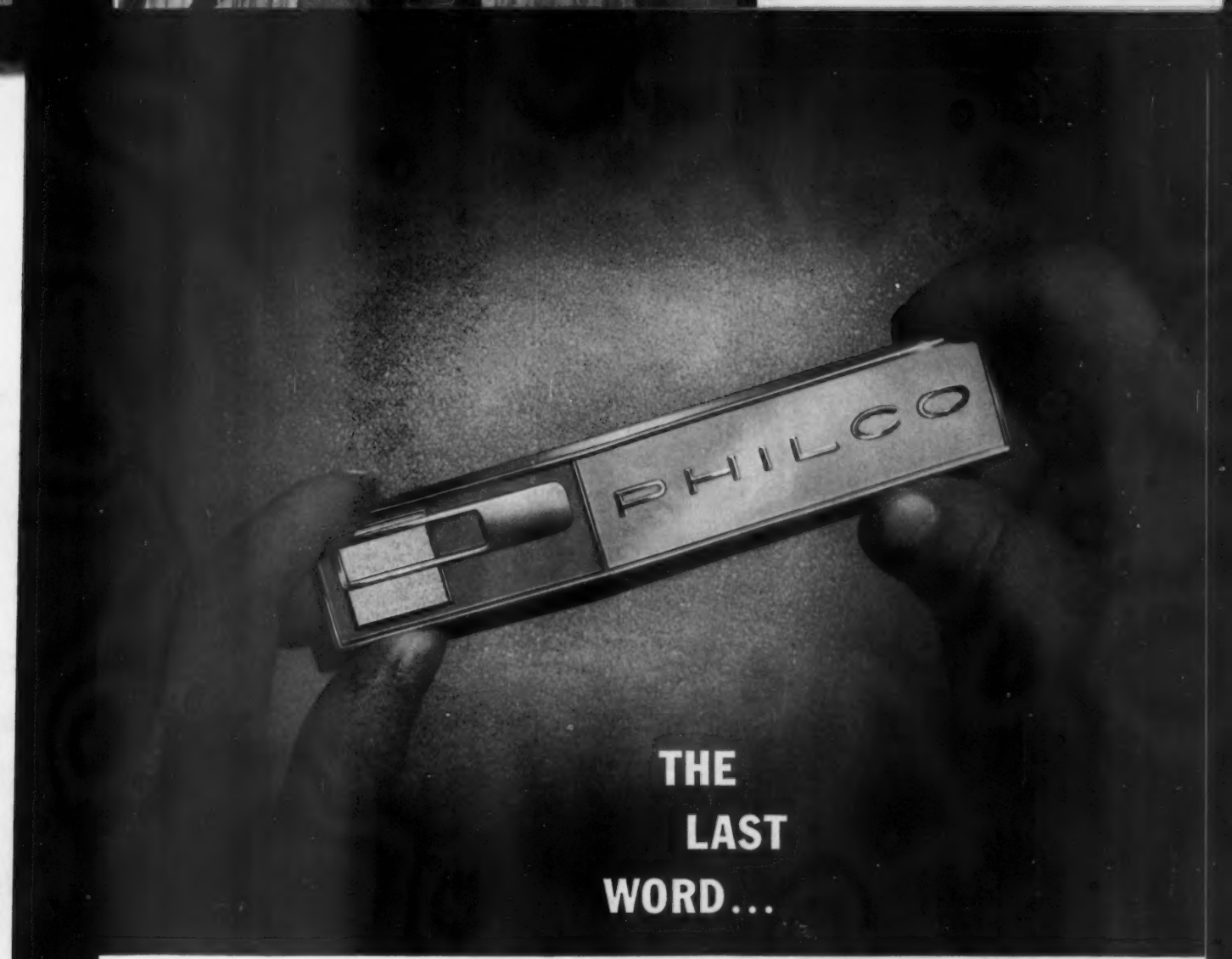
The Army manager must also communicate and make sure that all of his people understand that "nothing is sacred" and "anything the Army is doing can be improved."

Many management students feel that a glaring weakness in attempts to improve operations is the fact (or allegation) that "we do not back up far enough to question what we are doing." For example, a great deal of time and effort is devoted to attempts to improve the administration of the device known as the table of distribution. I am unaware that any time is being devoted to *questioning the very existence of the device known as table of distribution.* An earlier historical example of this deficient approach to management has been cited in the actions of those who put chrome on buggies instead of inventing automobiles. Quite naturally these examples lead us into a brief discussion of "evolution" and "revolution," and the part they play in the function of innovation.

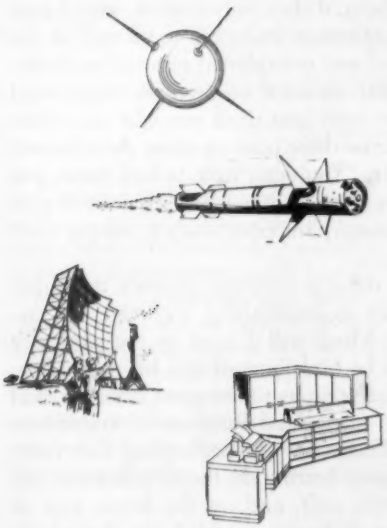
Value of suggestion programs

Evolution has been defined as "a process of development, formation, or growth." *Revolution* has been defined as "a complete or drastic change of any kind." Evolution need not be treated in detail. If the manager can insure that there is a continuing process of analysis of existing methods, procedures, devices, and the like, with a view toward improving *existing* things, there will be an orderly process of evolution going on at any given time. An aid to this evolutionary process is the service known as management engineering, which is available to most Army managers. One continuing precaution may be offered concerning the process of evolution. Care should always be taken that analysis of, and improvement of, one particular area of operations should consider the part *that* area plays in the larger unit of which it is a part. To do otherwise results in considerable inconsistency and may even result in an improvement in one area actually causing negative effects in others. Evolution is not simple by any means, but careful attention to it by the Army manager will result in improved management.

Revolution, on the other hand, presents the greatest challenge. The Army is steeped in tradition and customs, and this represents a pillar of strength. This asset becomes a liability, however, when it becomes an attitude of anti-change with regard to *needed* change and improvement. The nature of the stimuli to revolution in weapons management, tactics and strategy, from both within and outside the Army is well known and need not be discussed here. The student of Army management will readily agree, however, that the stimuli for revolution in other areas of Army management are far less dramatic and far less motivating. Hav-



THE LAST WORD...



A new brochure on Philco's CAPABILITIES is yours for the asking. Just write on your business letterhead for your copy.

...and your guarantee of peak performance, reliability and economy in a vast variety of complex ELECTRONIC EQUIPMENTS and SYSTEMS

PHILCO offers unequaled experience and capabilities in the creation, engineering and production of an unlimited range of sophisticated electronic and electromechanical devices and systems. In satellites, missiles, communications, infrared and weapons systems, Philco is a major contractor on many vital projects for defense. In communications, data processing, closed circuit television and countless other complex electronic products for industry and business, the name Philco is symbolic of quality. Whatever your requirements in advanced electronics, Philco has the people, the resources and the capabilities to meet them. PHILCO ... the *first name* in electronics ... the *last word* in quality. *Government and Industrial Division, 4700 Wissahickon Ave., Phila. 44, Pa.*

PHILCO®

Famous for Quality the World Over

ing accepted this fact of life, the manager must cope with it as he attempts to create a climate for creativity.

One action on the part of the Army manager which will help him create this climate is his open, enthusiastic, complete and sincere support of the suggestion program. This will serve to counteract or diminish the resentment people seem to feel when someone suggests improvements in their operations. Part of this resentment seems to reflect the feeling that the suggestions somehow represent a criticism of existing situations, for which they feel responsible.

A recent article in *Armed Forces Management* set forth a six-point platform for suggestion programs which has been widely adopted, in government, business and industry. The planks of that platform were: (1) put "top management" on the suggestion committee; (2) don't delegate the power to disapprove a suggestion any lower than the power to approve one; (3) the program must have the commander's personal support; (4) suggestions must be processed rapidly; (5) the integrity of the program must be carefully safeguarded; and (6) when in doubt, adopt the suggestion.

Experience has shown the value of suggestion programs. We must bear in mind, however, that the suggestion program is not an end in itself, but is a *means* to an end. That end is the climate for creativity which the Army manager must have in his unit.

There will never be a true climate for creativity in an Army unit, however, until each person in that unit feels free and motivated to think up new ideas and to submit them, and to *re-submit* them (which is more important) after the first disapproval. There is nothing so lethal to a new idea as the first No. And the very nature of the military relationship which requires strict obedience to orders from superiors by subordinates does not normally encourage the re-submission of new ideas after the first No. Research of new ideas which were adopted indicates that a majority of the better ones were turned down five to six times before adoption.

It follows then that the Army manager will not achieve the desired climate for creativity until the personnel of his unit feel free to try and try again to sell new ideas. One way to encourage objective and nonparochial analysis and evaluation of new ideas is to establish an SOP: each new idea submitted to supervisors must be sent up the chain of command to at least two higher supervisors before it is turned down. If such a system is used, the Army manager should take care to insure that all supervisors understand the purpose of the SOP and that it is *not* intended to usurp the prerogatives of supervisors.

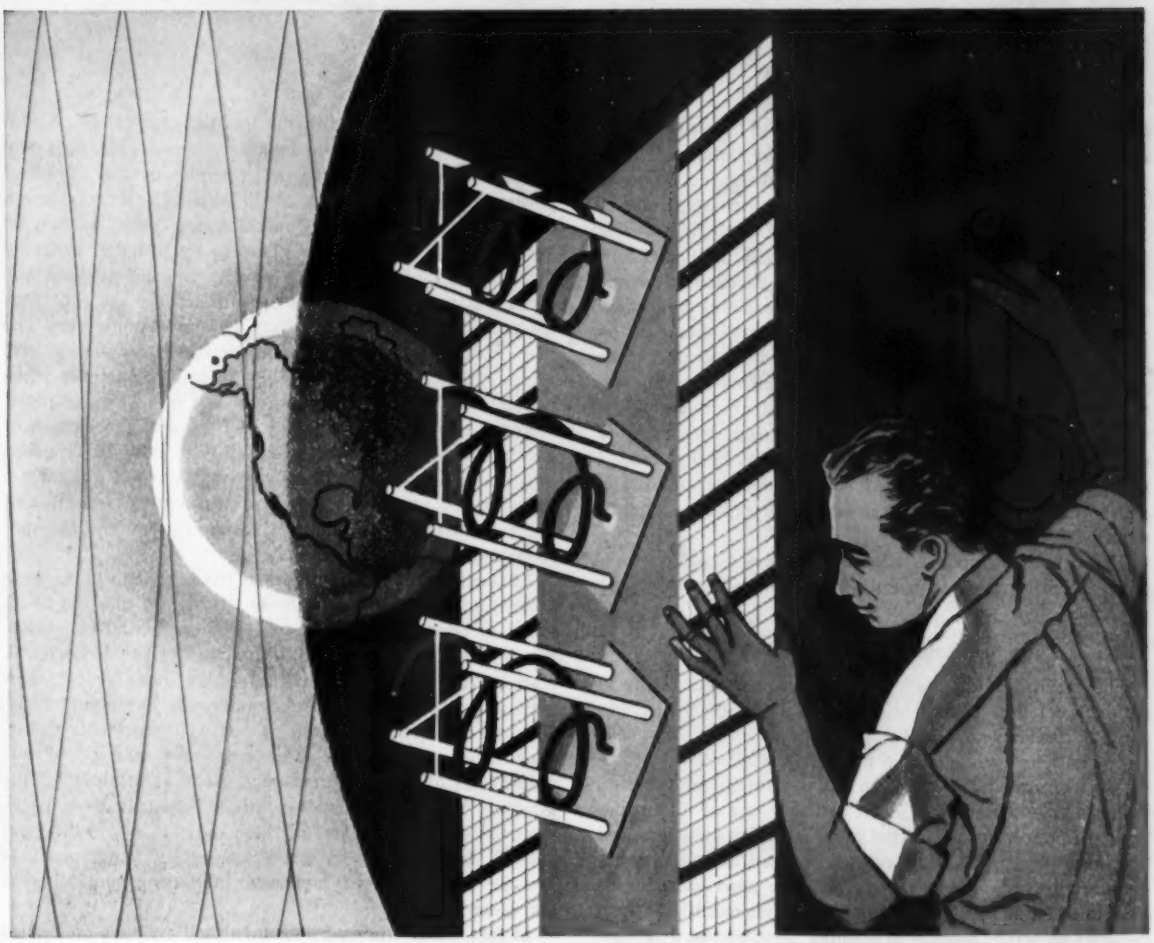
Creating the climate

In passing we should mention a few actions which will not contribute to the desired climate for creativity. Each of us has experienced this one. You had a bright idea and you took it to your boss. Duty did not require that you come up with the idea—it was above and beyond the call. Did your boss thank you and give the idea to the person responsible, along with the job of developing the idea? He did not! He gave the job to you, with a short deadline for completing the task, and you caught hell when the job was done and he was not satisfied with it! How many times since then have you gone to your boss with a new idea? How many times have you treated *your* subordinates the same way?

Another situation is where you have one (or more) bright ideas which you are sure the top boss would approve, but which you are even more sure intervening supervisors would disapprove or damn with faint praise. Knowing this, you keep the idea to yourself rather than let it die an unfair death. The number of these ideas and the value of them, if they were known, would stagger the wildest imagination. In fact, it could well be the greatest unexplored and unexploited resource in America today. And that resource will remain unexplored and unexploited in *your* unit until you take the managerial action to *release* those pent-up ideas. As a learned professor has put it: "You don't have to lead them; you don't have to drive them. All you have to do is to give them [the subordinates] an opportunity to release their potential."

Unfortunately, there is no magic formula the Army manager can apply in establishing a climate for creativity in his unit. Much will depend on the particular situation in which he finds himself and his unit. However, there is no question as to the great need for skill in performing the managerial function of innovation. The manager's effectiveness in performing this function will have a great bearing on the effectiveness and success of his entire unit, and on the larger unit of which his is a part. If he can establish the desired climate, his unit will be among the front-runners; if he fails to establish this climate, his unit will never achieve its true potential.

SYLVANIA ELECTRONIC SYSTEMS . . . IN FIELD ENGINEERING



"... Sylvania field engineering ... assures peak performance of Sylvania systems ... anywhere in the world."

Sylvania's experience with original, highly complex systems development dictated the creation of a staff of highly trained systems field specialists . . . engineers who have "grown with" the equipment they support, and who have a firsthand knowledge of its every capability. Sylvania field engineers meet the exacting personal and training standards set for the personnel of all Sylvania operating units. Their entire effort is devoted to the optimum performance of Sylvania systems.

Sylvania Field Engineering (a) administers all field programs; (b) maintains liaison with Division plants and laboratories; (c) conducts field tests of developmental equipment and systems; (d) installs and checks out delivered equipment and systems; (e) trains customer personnel in operating procedures; and, finally, formulates field policies and procedures targeted to unequivocal customer satisfaction.

This completely integrated service operates everywhere Sylvania systems go . . . which means world-wide. You are invited to send for a new brochure . . . "Sylvania Field Engineering Organization," which fully covers this vital part of the Sylvania Electronic Systems operation.

Sylvania Electronic Systems
A Division of Sylvania Electric Products Inc.
63 Second Avenue, Waltham, Mass.

SYLVANIA GENERAL TELEPHONE SYSTEM
Subsidiary of
GENERAL TELEPHONE & ELECTRONICS

Thoughts on Strategy in the Missile Age

A review by DR. ELLIS A. JOHNSON

BERNARD Brodie's book* should be read by every soldier of the Active Army, the Reserve, and the National Guard. It is important because it is a brilliant defense and rationalization of Air Force beliefs and doctrine and consequently of current official strategic policies of the United States. The author's résumé of strategic "principles" and of the modern change of military tempo in Part One is excellent, as is his comparison of recent theories of air warfare and their effect on national strategy in Part Two. The principal theme of the book is developed with great breadth and scope of knowledge, and it is clear, logical, and straightforward. The semantics are reasonably free of bias, and are thought-provoking. The merits of competing strategic, tactical, and weapon alternatives are fairly and meticulously discussed. I know of no other unclassified work that presents so well and so clearly the critical arguments and present status of strategy in the missile age.

Throughout his book Dr. Brodie provides numerous footnotes which represent a winnowing out of pertinent source material.

The need for Socratic discussion

The survival of our nation, and the role of our Army in national defense, depend upon the validity of the widely accepted theories advanced or summarized by Dr. Brodie. If airpower, above some certain minimum, is adequate both to deter a thermonuclear exchange and to contain communism, then the role of the Army is an ancillary one of minor and limited importance. But if the arguments for pure strategic dominance by airpower are erroneous—as I believe they are—and if the nation is to survive, then we need open discussion on a Socratic and public basis by professionally informed theorists to arrive quickly at sounder conclusions. I repeat: Dr. Brodie's arguments are brilliant and competent. I completely agree with him that there is an astounding lack of studies, both inside and outside the Government, of our overall national and military strategy, and of the nature of war. RAND and the Air Force have pioneered in the support of such studies. The other two services—the Army in particular—would do well to emulate the Air Force example, rather than, out of a mistaken sense of discipline, discourage public discussion of strategy.

The analysis of Part One is, as always, in Dr. Brodie's exceptionally penetrating and illuminating style, and is a pleasure to read. He restates in a new way ideas that most of us have had and leads one to say, "Yes, that is what I think; but here is an interesting new twist to the idea."

One of the primary findings of Part One is that strategic bombardment was not decisive in World War II, either in Germany or Japan. I am in thorough agreement. The rest of this part is concerned with the unsatisfactory state of strategic ideas, principles, and hypotheses; and difficulties and dangers of applying the vague principles by the imperfect governmental organizations of the West. Dr. Brodie brings out the effect of technology in collapsing "time" so that no longer can we educate our planners by bringing them up through the ranks. Progress is so fast that the weapons and tactical systems they learned are obsolete by the time they are ready to develop "strategy." To support this view one need only remember that, compared to the present five years, earlier planners based their principles on times when tactical and weapons systems lasted for fifty years or more. This difference is critical. Fifty years is about the length of professional productivity and new ideas could be absorbed in a man's lifetime, whereas five years is as yet too short a time for new ideas to be absorbed in any society because of the backwardness of cultural communications and the narrowness of executive education.

I believe Dr. Brodie exaggerates the last when he suggests an extreme innocence in military matters on the part of almost all civilian Department of Defense executives. Occasionally we are fortunate, as in the cases of James Forrestal, Karl Bendetsen, Donald Quarles, Frank Pace, Tracy Voorhees, and others in DOD, and Senators like Symington, Jackson and Kennedy (whether or not we agree with them). Furthermore, there have been extremely courageous and determined attempts to develop strategy at the level of the National Security Council. As Special Assistant to the President, Nelson Rockefeller led such a team, and with great success. His findings were rejected out of hand, probably because they involved increased military expenditures—a forbidden solution.

In fact, other studies by distinguished civilians concerned with the strategy of airpower have also produced notable results; for example, the reports of the Killian Committee, the Gaither Committee, the JCS committee on the same subject, and several others. The findings, in substantial agreement, always recommended increased military expenditures; always ended in the formation of a new committee—presumably in the hope of finding one that would recommend a *decrease* in the military budget.

Dr. Brodie brings out the detrimental effect of secrecy in preventing public appreciation of our parlous position. I agree: We are developing a bureaucratic oligarchy which uses classification to bar the public from knowledge which concerns our very existence. In view of Soviet superiority in many weapons systems developments, these bars seem to go far beyond the lawful needs of security. Thus, those competent to participate in the development of strategy must do so within the classified bars; those outside must do so in a vacuum of technical and tactical facts. It is also important to note with Dr. Brodie that a great deal of public information exists which does not communicate because it has no official status.

The will of the commander

Dr. Brodie tends to depreciate the importance of the will of the commander and morale. Although it may have been

*Strategy in the Missile Age. Princeton University Press, 1959. 423 Pages; Index; $6.50.

Dr. Ellis A. Johnson has been the Director of the Army's Operations Research of The Johns Hopkins University since its inception in 1947.

Sikorsky S-64 —new 8-ton payload turbine-powered flying crane

HIGH CAPACITY—With an 8-ton payload, Sikorsky's new S-64 turbine-powered crane, will carry *three tons more* than the experimental S-60. It is the first in a new family of Sikorsky turbocranes designed to carry up to *40 tons*.

TOP VERSATILITY—In restricted areas where even a helicopter cannot land, the S-64 is designed to raise and lower loads on a hoist, as above. Where landings are possible, cargo can be attached by cable to four hard points on the fuselage. The S-64 is designed to straddle bulky loads nine feet high and almost 20 feet wide. A variety of passenger and cargo pods, bins and platforms, plus almost vibration-free suspension will make the S-64 a Universal Transport Vehicle of unprecedented versatility and usefulness for military or commercial service.

PROVED DEPENDABILITY—Sikorsky's program of step-by-step progression with thoroughly proved designs and components will assure users utmost dependability. Vital rotor assemblies, gearing, controls, and other dynamic components for the S-64 have been proved by years of service in Marine Corps and Army S-56-type helicopters. The crane concept has been tested and demonstrated for many months in the S-60.

FIRST FLIGHT—The first S-64 is programmed for flight in the fall of 1960.

SIKORSKY AIRCRAFT, Stratford, Connecticut
A division of United Aircraft Corporation

LINES FROM *STRATEGY IN THE MISSILE AGE*

WHO STUDIES STRATEGY?

The military profession is, however, an esoteric calling, requiring familiarity with specific tools, skills, and organizational peculiarities that are likely to be utterly bewildering to the scholar outside the profession. Therefore the study of strategy, which is in part historical but in larger part also analytical and speculative, has tended in the past to fall between two stools, being neglected by the professions of arms and of scholarship alike.

Until the coming of atomic weapons, which produced such a wrench from the past, writings in strategy were usually built upon critical study of the military history available to their authors. Military history provided vicarious experience, broader in scope and cheaper to acquire than that available to one individual in his lifetime. To be useful the history had to be accurate and preferably recent, it had to be read, and it had to be interpreted with insight and imagination.

Where it was not so read and so interpreted, the officers responsible for the formulation of service doctrine tended to rely exclusively on that inevitably incomplete military experience which was intensely personal to them or their immediate colleagues. As a result we have seen deep and persistent military controversies where each side has implemented its arguments with historical "facts" wrested out of context and otherwise distorted.

exaggerated by Foch, recent examples show that the will of the commander can change defeat into victory. Examples are General LeMay in the XXI Bomber Command in 1945, and General Ridgway in Korea in 1951.

The author passes over lightly Ardant du Picq's observation that new ferocious weapons do not long affect strategy because of tactical adaptation by dispersal, mobility, and defense. I believe du Picq is right: that each military epoch deals with a transitory strategy determined by weapons and tactical innovations leading to dilemmas which ultimately are resolved, so that in the case of ground action the "average" casualty rate per division-equivalent per day returns to an ageless constant.

We are in the midst of an outstanding barrage of such transients related to the increased tempo of weapons development. Dr. Brodie lays the basis for Part Two when he suggests that in air war the offensive has indeed achieved permanent ascendancy over the defensive. In spite of his logical skill he has, in my opinion, failed to make his case in this hypothesis, on which all the rest of his book rests. In my opinion, the offense has no more ascendancy today than in older times except in an always-recurring transitory way. The real question is whether this transitory advantage can be prolonged in its strategic effects.

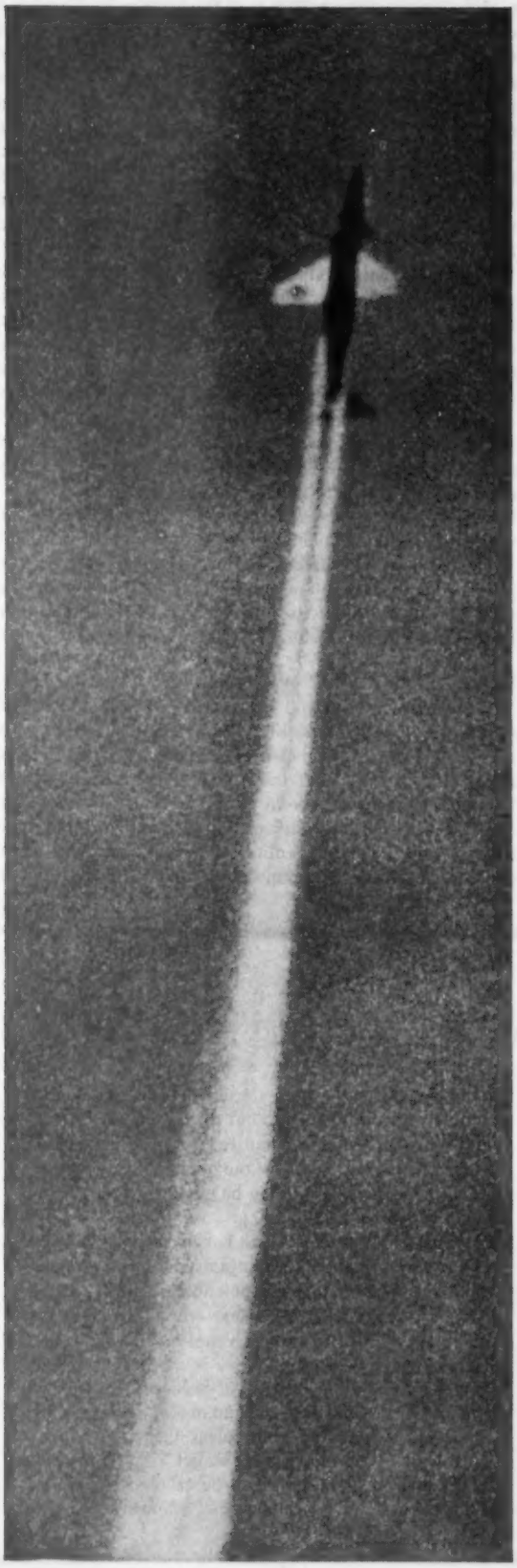
In reading Part Two, one should bear continuously in mind Dr. Brodie's use of Air Force semantics. These semantics pervert "strategic" to mean air weapons and airpower—all other weapons are "tactical" and thus of lesser account. Thermonuclear war equates to general war and air war, with limited war as of limited importance. "Central" war is war conducted by airpower—all other wars are peripheral and thus of relatively minor importance.

The twin evils of semantics and additive reasoning

Dr. Brodie cogently makes the point that strategy must be considered in the systems sense: from national goals down to the specific weapons that are used to implement tactics, which are used to implement strategy, which is used to implement national policy, which is used to implement national goals. If we discard the Air Force's cloudy semantics, no weapon is more strategic than any other weapon; air power is no more strategic, *per se*, than ground power or sea power. The destruction of Carthage resulted from Roman strategy. Was the sword then a strategic weapon rather than a tactical arm? Tamerlane destroyed more than one city (and nation) for strategic reasons. Were the bow and the sword then strategic weapons? Weapons, tactics, and service systems and organization are all tools of strategy!

Another logical trap common in defense arguments is the use of additive reasoning to the exclusion of other kinds of logic. The cause is semantic. Thus, if one new aspect of U. S. strategy is more immediate, and fashionable, if it requires great effort, if it is more easily understood, if it has popular support, and in short if it is more "important," then we are inclined to assume that the over-all strategy has the best chance of success if the "important" thing is done and the lesser ones neglected. Thus, in the argument of morale-versus-matériel (three to one in importance according to Foch), an additive equation of morale *plus* matériel leads to the conclusion that matériel can be neglected. This is obvious nonsense. If, on the other hand, tactical success depends on morale *times* matériel, which seems more reasonable, then *neither* can be neglected without risk of defeat and the question is how to maximize the product, not the sum.

I believe the problem of thermonuclear deterrence involves such product relations as well as additive logic. The equation of deterrence involves four parameters on each side: striking power, defense, the economy, and the population—and thus the balancing of sixteen interactions. Strategically we search for a solution of such a complicated problem by minimax techniques. Dr. Brodie has sought for a simpler solution by his firm, but unwarranted, hypothesis that defense against thermonuclear delivery is impractical. To the contrary, even RAND has agreed that defense against attack by aircraft (with all the sophistication of such attack in its modern form) is a *fait accompli* in principle, though requiring only heavy funds and effort. Dr. Brodie seems to me sadly at fault and in ignorance of the detailed background when he criticizes General Gavin on this score. The question of defense against missiles, I must agree, is uncertain. Dr. Brodie writes as though intercontinental missiles



NEWS IS HAPPENING AT NORTHROP

TARGET MISSILES FOR TRAINING
DRONES FOR WEAPON SYSTEM EVALUATION
DRONES FOR AERIAL SURVEILLANCE

TRAINING FOR AIR DEFENSE– THE BEST THING TO FIRE UPON IS A RADIOPLANE TARGET

Radioplane's business for twenty years has been to know military target applications and to produce target aircraft that fill specific training requirements.

SIMPLICITY OF OPERATION AND MAINTENANCE

Radioplane applies its experience and talent in the target aircraft field to simplify design – to avoid complexity and to produce targets that are simple to operate and maintain in the field.

FIELD SUPPORT

Flexibility is the key word in Radioplane's field support. Radioplane provides total flight service including training, target operation, maintenance, and repair.

MINIMUM COST

To hold production costs to a minimum and still meet a broad range of military requirements, Radioplane has created an entire family of pilotless aircraft that offer our Armed Forces budgetary selectivity–without performance penalty. Radioplane combines the latest state of the art with balanced design. Radioplane's "dollar engineering" delivers the best targets, the most effective unmanned aircraft–at minimum cost.

RADIOPLANE

A Division of **NORTHROP CORPORATION**
Van Nuys, California, and El Paso, Texas

were already operationally ready for use. I know of no firm evidence to this effect. Again, it is only a matter of funds and effort on both sides.

Defense need NOT lag behind offense

What is certain is that in the U. S. our defense capability lags our offense capability. This is much less so in the USSR. It is not at all unlikely that Soviet aircraft will be very effective against U. S. targets but that U. S. aircraft will be much less effective against Soviet targets because of superior Soviet defenses. Dr. Brodie is right when he argues that aircraft will remain as an important weapon. Aircraft delivery of thermonuclear bombs will remain effective and will require the existence of even more effective counter defenses.

Dr. Brodie generalizes the Navy's defense against air attack in World War II but neglects discussion of interceptors. I saw the beginning and end of the war in the Pacific, including the attack on Pearl Harbor, where we were caught in surprise to our great loss. What a contrast to the "Turkey Shoot" of the First Battle of the Philippine Sea at the time of the invasion of the Marianas! In that battle I watched on the radar more than ninety per cent of the Japanese 300 planes attacking our fleet killed by U. S. carrier fighters. A 300-plane raid would be respectable even in these modern times! However, since 1944 air defense against aircraft has improved by factors ranging up to a million times or more per defensive weapon, depending on altitude, and *including* altitudes down to 100 feet. We must conclude that Dr. Brodie's thesis in Part Two remains unsubstantiated in so far as the conflict between aircraft and defenses is concerned.

Our lead time ill-serves us

He is in a better situation with respect to missiles. Here the critical disadvantage of the U. S. is our backwardness and slowness in military technology. It takes us ten years to develop a weapon system, the Soviets five years; yet we took only two and a half during World War II. This lag in development time means our defenses lag behind new Soviet offensive delivery systems. The reverse is not true; the Soviets have time to develop defenses against our slow-moving missile program. If this is correct—and I believe it is—lack of symmetry in defense makes it difficult to continue with a criticism of Part Two of Dr. Brodie's book even if his basic hypothesis is invalid. The essence of his hypothesis with respect to the lack of success of any kind of defense, as stated on pages 164-165, is not based on fact, but is accepted as a fact on page 166 and from then on.

I cannot resist agreeing with Dr. Brodie that interceptors and Bomarc cannot provide an effective defense; whereas, I believe Nike, Hawk, and Zeus can, against aircraft, decoys, and electronic countermeasures, in any attack at any altitude. And, in the case of Zeus, with an excellent future chance of defense against missiles. In any event, we can have a defense (if we spend the money) that, combined with a strong offense, will insure deterrence and will certainly limit the war to one strike, since missiles will be shot down and expended and aircraft will all be shot down except for a trivial percentage—provided only that we speed up our weapons development time to World War II standards.

I agree with Dr. Brodie on the great need for shelters, fallout and other, for the entire populace, and on the fact that all forms of defense, active and passive, have been treated in a miserly fashion.

Our values must be doubly defended

I am one of those who believe the Soviet leaders would sacrifice much to possess the world. They brought death to tens of millions of their own citizens for the sake of policy during the thirties—and they incurred with great bravery many millions of deaths in World War II. I believe this contrast with our unwillingness to risk American lives on such a scale, unless our entire social existence were threatened, represents an asymmetry of value systems that re-

LINES FROM *STRATEGY IN THE MISSILE AGE*

LIMITED ATOMIC RESPONSE

. . . many Americans, including practically all the highest civilian officials as well as military officers, insist that if our response to an aggression has to be limited geographically, at least it must be atomic. The reasons usually given are, first, that it is much cheaper to prepare for and fight limited wars this way—one idea is that we could even do it with just a small part of our SAC—and second, that otherwise we might lose.

This almost universal insistence on using nuclear weapons is hard to explain unless we surmise an unconscious assumption that the United States is still in a near-monopoly position and that American use of them will therefore be unilateral. The moment we start visualizing them as being used reciprocally, their use ceases to look overwhelmingly advantageous to us. They do not make intervention cheaper, or the prospect of winning surer. They seem to be at least as useful to the offense as to the defense. The exception would be the case where the enemy was invading a country with masses of ground troops and we and the allies we were defending had few or none in the area —in short a situation where the opponent was presenting all the targets. Even then he could retaliate against friendly towns and villages.

It is probably true, as some have written, that readiness to use atomic weapons against limited aggression would have a great deterrent effect, but only if the prospect of fighting in a nuclear environment did not reduce our willingness to intervene. For it would seem that our willingness to intervene is more important as a deterrent than the choice of weapons. Since presumably we are no longer thinking of unilateral use (if we are, we should make clear the circumstances under which we would expect to get away with it), it is not at all clear that we will be as ready or readier to intervene if we expect nuclear weapons to be used

quires us to be doubly safe against Soviet attack. Such asymmetries in the past—Assyria against her neighbors, Sparta against Athens, Genghis and Tamerlane against the rest of the world, Hitler in World War II—bear evidence to the importance of the will of national leaders and cultures in initiating unprovoked aggression.

Two minor errors in the book disturbed me: one with respect to chemical warfare and biological warfare in World War II and Korea, and the other on atomic weapons in Korea. With respect to the first, so far as I know we had to refrain from using chemical and biological weapons because we were not prepared.

Atomic targets in Korea

With respect to atomic weapons in Korea, the commanders of Eighth Army and the theater were in agreement from the beginning that atomic targets existed. ORO had 150 analysts in Korea, and among other tasks they provided continuous analysis from September 1950 on with respect to atomic targeting. Furthermore, the commanders of Eighth Army and the theater asked for the allocation of weapons in 1951.

In 1953, at the front lines, I asked Lieutenant General Reuben E. Jenkins how long it would take him to find atomic targets in the opposing Chinese forces. He replied that such targets occurred continuously. In fact, Dr. Brodie's second paragraph on page 319 is quite contrary to the facts, as known to me.

The military budget and the economy

I agree completely with Dr. Brodie that the United States can afford to greatly increase its military budget without in the slightest endangering our economy. Our military R&D program probably returns $50 billion yearly to our gross national product, so that we have a neat profit at present rather than a drain.

We could probably spend $100 billion a year on defense without endangering our economic well-being.

In spite of my somewhat severe criticisms I agree rather well with the way in which Dr. Brodie has organized his logic. Because we disagree on the feasibility of a highly effective defense, we inevitably disagree on how military funds should be spent; but we agree we must and can afford to spend much more.

I agree also that the Administration and the Department of Defense make extensive use of scientific methods in solving strategic problems, and almost invariably reject the findings which usually require an increase in the defense budget. What good is scientific wisdom if it is never adopted? Is it more important to maintain an arbitrary budgetary constraint, that most economists consider necessary, than to reduce the danger to our country?

I was disappointed at the absence of a more complete discussion of disarmament, although this was less in the air when the book was in the writing.

With respect to limited war and ground warfare, I think Dr. Brodie has missed the boat, because he has used additive logic. I reach an opposite conclusion. I believe that as we achieve mutual thermonuclear deterrence in the true sense, the Soviets will be free to take the world in a series of limited wars and will do so unless we defend equally against subversion and limited war. I argue that our survival depends equally upon thermonuclear deterrence and containment of communism. We can lose the world unless both are assured.

In a final comment on Dr. Brodie's speculations on overpopulation, I suggest that if we have peace, the Malthusian crisis is at least two centuries away, and with a rousing thermonuclear war more centuries than that!

In summary, it is clear that Dr. Brodie has not answered the big question about the nature of future war, but then, who can? He has written a brilliant, penetrating, important book which deserves wide reading. Equally important, it deserves an equally brilliant unclassified rebuttal and presentation of the antithesis.

---

as we would with a contrary expectation.

* * *

We have no basis for arguing that the use of nuclear weapons in limited wars is clearly mistaken. One must add, however, that it is far from being unequivocally right. It is certainly wrong to conclude they must be used in *all* limited wars except possibly the very smallest. Perhaps they will have to be used in some situations, but one would expect that the situation which required their use would be spelled out in terms that could not be stultified the moment we consider *reciprocal* use. The conclusion that nuclear weapons *must* be used in limited wars has been reached by too many people, too quickly, on the basis of far too little analysis of the problem. Decisions of great moment have stemmed and continue to stem from that conclusion, decisions which work to deprive us of a capability for fighting even a small war without nuclear weapons. Once we are in that position, the original proposition, however mistaken to begin with, appears to be proved right, for the fact that we cannot fight without nuclear weapons argues cogently that we should not attempt to do so.

Because of our complete lack of experience with the problem, we simply do not know whether it would prove both sound and feasible to use nuclear weapons in wars that otherwise have a chance of being kept limited. By "sound" use we mean one where nuclear weapons would work for rather than against realization of the political objectives of the war. By "feasible" we mean first, that use of nuclear weapons will not make it critically more likely that a limited war will erupt into total war; and second, that the decision whether or not we intervene is not affected adversely by the fact that we are committed to fight with nuclear weapons. If we were so committed, that fact might press us to avoid involvement, that is, to abandon the local issue. The American decision against intervening at the time of the Dien Bien Phu crisis in Indochina in the spring of 1954 seems to have reflected such a dilemma. We can let our thinking be paralyzed by the conception of masses of Soviet divisions, but the only direction in which the major part of the Russian ground forces could be deployed is westward into Europe. In other regions on the periphery of Communist power the terrain and logistic facilities simply would not permit it.

MIND Against NUKES

What do we now know about what nuclear firepower will do to the mind of the soldier on the battlefield?

Major JOHN T. BURKE

WHAT effect will the nuclear battlefield have on the mind of the soldier? Will it reveal a new psychological dimension, or is the military psychologist chasing an atomic-age phantom? The psyche of the soldier defies the scientific slide rule. However, we can seek an approximate and meaningful answer by relating accepted psychological principles to the measured effects of nuclear weapons.

Actual or threatened radiation may well produce wide-spread anxiety and resultant neurosis among troops, probably more so than any other nuclear effect.

Though military writers often use the terms "fear" and "anxiety" interchangeably, there are significant differences between these phenomena. Fear is the immediate response to actual danger; anxiety is the fearful and often irrational anticipation of real or fancied danger. Anxiety generates neurosis, and is far more debilitating than fear, since the individual is overwhelmed with uncertainty and unable to react effectively.

Several characteristics of radiation suggest its neurosis effects. First, unlike other nuclear effects on the battlefield, radiation is entirely unique. Secondly, the soldier can evaluate the threat only by using detection devices. These can easily be misused, thus producing a false sense of security or exaggerating the threat. The effects of radiation are insidious and latent, rather than immediate and direct.

Finally, the soldier has been exposed to a great deal of misinformation concerning the effects of radiation

---

Major John T. Burke, Armor, a 1945 graduate of West Point, has had various company commands and staff assignments in intelligence, logistics, training, and human engineering research. Recently graduated from the Command and General Staff College, Major Burke is with the 1st Infantry Division at Fort Riley. He wrote "Curves or Fast Balls?" in our March 1959 issue.

and the alleged hopelessness of protection against it. This applies particularly to the possible cancer-producing effect of radiation, as well as to sexual sterility or impotence, or both.

Other radiation factors will aggravate the psychological vacuum in which the soldier finds himself. There will be rumors of fallout that does not in fact exist; and even the best-trained soldier may interpret "normal" psychological reactions to battle, such as shock and nausea, as radiation symptoms.

In these factors we have the classic ingredients for severe neurosis. This is not to say that "radiation neurosis" is a new kind of psychological reaction. The soldier will experience the same symptoms and reactions as when he is confronted with the threat of gas, or moves through a suspected minefield. However, we must expect anxiety of much greater scope that may incapacitate far more troops in a shorter period.

Man dreads loss of his sight perhaps more so than any other deformity (with the possible exception of sexual impotence or sterility). Threatened or actual damage to a victim's sight has always been a classic form of torture, and even today is a primary tool of criminal coercion.

Nuclear Blind Man's Buff

The degree of flash blindness produced by the nuclear fireball ranges from temporary loss of vision to severe retinal burns and permanent loss of sight, depending upon several inter-related factors such as light conditions, yield of the weapon, and degree to which the eyes are focused on the fireball. Of particular psychological significance is the fact that the nuclear flash is practically instantaneous, and protection depends upon forewarning. Knowing this, the soldier may be severely inhibited in performing duties requiring visual alertness.

The post-burst psychological dynamics will be particularly acute. Many soldiers will be not only blinded,

but in a state of panic and shock. In this condition their natural, automatic reaction will be to strike out in any direction, against every real or imagined threat, with any weapon at hand. Before a soldier can be subdued, he will most likely kill or wound many of his effective comrades.

This, then, is the tragic nuclear version of the children's game of Blind Man's Buff. This is no new kind of psychological reaction. On many battlefields frightened soldiers have been unable to distinguish friend from foe. Nor is blindness unknown to the "conventional" battlefield. But never has there been the potential blinding of hundreds—perhaps thousands—inherent in a single nuclear explosion. When he loses his sight, the soldier becomes a battlefield liability.

Ordeal by fire

Man can easily panic when faced with the threat of fire. Examples that come to mind are the well-known *Morro Castle* incident and the Coconut Grove nightclub catastrophe. It is commonly accepted that death by burning is man's most agonizing experience.

A group of experienced armor officers once agreed that the greatest dread of the tank soldier is to be trapped in a burning tank. They also agreed that, in their experience, the sight of half-alive men in a burning tank was the most revolting battlefield scene.

What, then, are we to expect as the psychological reaction of the soldier to the actual or anticipated thermal effects of nuclear weapons?

First, because of man's natural dread of fire, we must expect "thermal neurosis" to further aggravate the radiation neurosis we have described. Secondly, actual thermal effects will add to the chaos of the nuclear battlefield. The soldier will see many comrades trapped in forest fires, flaming vehicles and structures. Many will be half-alive, screaming, and still burning. Not only will such scenes produce severe psychological trauma, but the soldier may often attempt to assist his comrades to the detriment of his tactical mission.

Thermal effects are not unknown on the nuclear-free battlefield. But the soldier faced fire of this kind only occasionally; now he must expect it as a common experience.

Nuclear-blast effects

Blast is characteristic of all explosions. Yet, the tremendous pressures and concussion of a nuclear blast produce bizarre effects for which the soldier must be psychologically prepared.

In the shock of the explosion, he may become confused as to whether the primary effects of over-pressure, or the secondary effects of flying objects, are the principal killers. Despite knowledge and training, we must expect that many soldiers, dazed and disoriented, will behave in a completely irrational manner. Some will leave their shelters too soon. Others will freeze in a stupor and refuse to act at all for some time following the blast.

So powerful is the blast effect of a nuclear explosion that not only will the bodies of some victims be hurtled great distances intact, but many will be dismembered if not actually shredded. Thus, another effect observed occasionally on the nuclear-free battlefield will be greatly magnified. Heads, limbs, blood and bits of flesh and bone will literally rain over a considerable area of the battlefield. This may produce severe psychological trauma in large numbers of the uninjured.

The nuclear panic button

Panic differs from the psychological reaction of the individual soldier. In panic, the soldier becomes a part of the "collective mind." As part of a group he abandons himself to impulses not of his own nature. Often the soldier finds the battlefield quite different from what he expected, and consequently behaves irrationally during combat.

Of particular importance to us here, the enemy's introduction of new equipment will encourage panic, generally in proportion to its destructive effects. The machine gun, the first use of tanks and gas, the sirens on German planes, the proximity fuze—all these created panic of tactical significance.

Consider the possible effects of an enemy threat to use nuclear weapons in specific localities; or perhaps the mere planting of a rumor. Entire units, already ridden with nuclear neurosis, may precipitate a mass stampede from the battlefield. Thus, what is known as atomic blackmail at the strategic level becomes a habitual and effective tactical weapon.

What about the likely panic effects of an actual nuclear burst? Some troops will be physically whole but in a state of psychological shock, and in that condition wander aimless over the burst area. Others will be alive, but badly incapacitated. Knowing they are helpless, they will attempt to move to the rear. Those blinded, but still in possession of a weapon, begin the promiscuous fire we have described as nuclear Blind Man's Buff. All will expect the nuclear explosion to be followed by an enemy assault, and realize that they have no weapons, no vehicles, no communications, no leadership—in short, that they are no longer even the semblance of a unit. Any one of these men can precipitate widespread panic.

Troops on the distant shoulders of the nuclear penetration have heard, seen, and felt the blast. They are untouched and still retain their tactical cohesiveness. They feel a slight breeze in their direction, and dread the fine fallout dust they expect will follow. Casualties from the burst area begin to infiltrate the unaffected units. Some of the infiltrators are blinded, and still firing at every sound. Someone yells "Withdraw!" That does it. Entire major units, untouched by the actual explosion, relied upon to hold the shoulders or block further penetration, disintegrate in utter panic.

Throughout history we read of panic occurring in the best and worst of units. But never has there been the potential for widespread military disaster triggered by

the nuclear panic button.

What can we do to prepare our troops psychologically for their nuclear baptism?

At the outset, we must acknowledge that no measures which are morally and politically feasible can adequately prepare the soldier's mind for "conventional," much less nuclear, warfare. The battle itself has always been the ultimate field exercise and confidence course; no doubt it always will be.

How do we prepare?

Certain measures of psychological value have been introduced into current training. The soldier is taught that he must expect to come under nuclear fire. He is told of the effects of nuclear weapons, and is trained in protective measures. He is advised that he must be tougher, both physically and mentally, than ever before. He sees training films of nuclear explosions and their effects, and engages in field exercises under simulated nuclear conditions. Finally some troops participate at Desert Rock when the real thing is fired.

Laudable as these measures are, as presently applied they are a poor masquerade of the nuclear battlefield.

How can we improve our nuclear confidence course?

First, no artificial means can duplicate the awesome effects of a nuclear explosion. The current program of participation at Desert Rock should become routine, and repeated when possible, for every soldier. Troops should experience the effects of the explosion to the greatest practicable extent. Conditions should be such that any failure to adhere strictly to directed procedures will likely result in serious injury. Actual panic situations should be provoked, thus familiarizing troops and their leaders with the dynamics of panic and required control procedures.

Secondly, we must in every possible way create the nuclear scene in day-to-day training. On the nuclear shock course the soldier will face severe physical and psychological obstacles. Ground zero will be marked by nuclear simulators coupled with extremely powerful explosives on the ground. Within appropriate radii of ground zero, every horror of the nuclear battlefield will be duplicated as realistically as possible. The area will be strewn with blood and plastic replicas of dismembered human bodies. Sickening stenches will emanate from carcasses and chemicals. When he enters a contaminated area the soldier will become sick from chemicals which represent radiation. The flash of the nuclear simulator will be powerful enough to induce temporary flash blindness in the unprotected soldier who observes it. On every side, he will be attacked by blinded comrades (soldiers trained to realistically act the part), and the battlefield will be littered with burning debris.

Confidence through familiarity

This nuclear shock course should be a routine feature of tactical exercises and maneuvers, rather than an occasional, independent test. Eventually this procedure will engender both respect for nuclear effects and confidence through familiarity. The soldier will perceive the value of dispersion, small-unit tactics and leadership, and the necessity to react instantly to SOP protective measures.

What in the past has been largely academic and superficial first-aid training in medical self-preservation must become intensive and realistic. It is a grave psychological error to tell the soldier that lack of medical aid might be commonplace, to imply that he may have to die in what comfort he can, and then fail to teach him rudimentary battlefield medicine. Often he will have to complete amputation of a limb, not simply dress it.

The most serious obstacle to adequate preparation of the soldier for nuclear warfare is our traditional social, cultural, and political climate that does not tolerate the hazardous training measures required. It would be unrealistic to suggest that this attitude can be completely modified; but this does not justify the negative attitude which maintains that it cannot be changed at all. We must implement an effective public information program which will convince the American people of the vital necessity for rigorous, hazardous preparation for nuclear war.

Above all, our peacetime disciplinary philosophy must approximate the discipline required on the nuclear battlefield. That battlefield will permit no first-offense reprimands, no hands-off approach, no gentle correction. Of necessity, nuclear discipline will be harsh, perhaps at times ruthless. To suddenly shift from moderate to harsh discipline in the heat of battle is to invite psychological disaster.

THERE is no reason for concluding that nuclear warfare will introduce a new kind of psychological reaction. The psychological dynamics of fear, anxiety, and panic will apply in nuclear warfare as they have on the battlefield of the past.

Neither are military psychologists chasing a phantom. So greatly have explosive effects of nuclear weapons been condensed in time and expanded in area and personnel casualties that for all practical purposes we face a new psychological dimension.

Similarly, requirements for training, leadership, and discipline have not changed in principle. But even the best standards of the past are insufficient to cope with the new psychological dimension. We must increase our training in both scope and intensity, even at much greater hazard to the soldier. And we must create the climate of public opinion that permits these essential measures.

Finally, we must add a much larger damage area to our tables of nuclear effects. This area is not a neat, circular pattern with a radius of a few hundred meters. Rather, it is a huge, funnel-shaped area, measured in hundreds of miles, that extends from the combat zone through the administrative zone into training camps in the zone of the interior. This will be designated the "area of psychological casualties."

The Do-ers

Master Sergeant FORREST K. KLEINMAN

TODAY we in the Army recognize the need for creative military thinking posed by technological advance. Idea men stand tall in the limelight of professional opinion. Their contributions to the Army's progress are extolled from service school podiums and in the columns of the military press. Military honors—even monetary rewards—are bestowed upon them in the crash program to stimulate the output of new ideas.

But there is a Forgotten Man in the creative process—an unsung hero in the history of every successful innovation. Without him, the most brilliant idea would be stillborn.

He is the Do-er.

This is the man who has the faculty for recognizing a good idea, the initiative to do something constructive about it, and the moral courage to persevere in the face of opposition or indifference. More often than not he is the man, rather than the originator, who must stake his professional reputation—sometimes his very career—on the worth of an original idea. Accordingly, the numerical ratio of Do-ers to Idea Men runs low.

Walk into any officers' or noncommissioned officers' club—especially during the Happy Hour—and you'll see Idea Men by the dozen. Without stirring from your bar stool, you'll hear suggestions for improving everything from a staff section SOP to the organization of the Pentomic division.

Many of these airborne brain children will perish for lack of elbow grease applied to a lead pencil. Many of them ought to perish unrecorded for the good of the service. But even a worthy one that lives to see paper may die there for want of a Do-er.

Human nature being what it is, a dearth of Do-ers behind action desks in any outfit would not be surprising. For the easiest word in any language to pronounce—especially in response to a suggestion involving change—is No!

Though Do-ers usually gravitate to positions of command, their services in any rank or assignment can be valuable to the Army. Nursing a single good idea through puberty into practical application sometimes requires quite a few Do-ers acting in diverse capacities. One such case I recall involved a former soap salesman, a rifle company commander, an "Old Army" colonel, and an admiral.

The idea was born one hot summer day in 1941 on the parade ground of Fort Lewis, Washington. It sprang full-blown into the mind of a young shavetail while he watched the 3d Infantry Division dry-run an amphibious operation.

Under the SOP adopted from the pre-World War II Marine Corps manual, tactical units loaded administratively aboard troop transports, formed boat teams on deck for debarkation into landing craft, then reorganized into tactical units after hitting the beach. Noting the confusion that attended this procedure on dry land, in broad daylight, and in the absence of enemy fire, the fledgling Idea Man asked himself a very simple question: Why not train, stage, move, load, debark, and fight to the first objective *by boat teams?*

The next day he put the question to his company commander—a lifelong Do-er named Lawrence L. Beckedorff who is now a colonel assigned to the Armed Forces Special Weapons Project. The answer was: "Put that down on paper and we'll submit it through channels to the War Department."

BACK came a crushing indorsement from battalion headquarters: "Not favorably considered. If the War Department wanted recommendations on the conduct of amphibious operations from lieutenants, it would ask for them."

The idea remained in this coffin of disapproval for almost a year. It might have been buried for the duration if a chance conversation hadn't brought it to the attention of another Do-er—Colonel Thomas H. Monroe, then commanding the 15th (Can Do) Infantry.

Colonel Monroe immediately installed the Idea Man as S3 of a battalion landing team to try out his brain wave on the sea waves lapping Coronado and La Jolla beaches. When the BLT was ready to embark at San Diego two weeks later, Colonel Monroe saw to it that observers were invited from Joint Amphibious Training Headquarters at Camp Pendleton, California.

Master Sergeant Forrest K. Kleinman, a frequent contributor, is on duty in the Information Office at USCONARC.

Every Idea Man needs a stalwart behind him who isn't afraid to say "Do It"

Despite the handicap of antiquated steam-powered winches on their ship, the "boat-team"-trained battalion loaded and embarked speedily with clockwork precision. By the time the observer group of Marine officers arrived on the scene, the battalion was ready to sail. Not unnaturally, the Marines were highly skeptical. How could a doughboy battalion cut hours from the time required by Marine battalions?

The suspicion was voiced that full combat strength in personnel, equipment and supplies was not being used in the test. Since a piece-by-piece inventory of the loaded ship was out of the question, the suspicion persisted.

Throughout the exercise, the observers deigned to be impressed. The record-breaking speed of debarkation into landing craft and lack of confusion on the beach failed to dent their doubt. As one Marine candidly remarked, "Anyway, how can the Army show the Marines anything new about amphibious operations?"

"Not favorably considered" was the gist of the report that went back to Camp Pendleton.

AGAIN the Idea Man was crushed. Further reason for gloom was raised by visiting members of his own division's staff. They asked embarrassing questions: "Why didn't your battalion follow the division SOP during this important phase of its training? Where is your written authority for trying out a radically different procedure?"

Not even Colonel Monroe could answer that last question, since he'd acted on his own initiative. And it wasn't considered cricket in the 15th Infantry for officers to pass the buck up *or* down. The Idea Man began to wish he'd strangled his brain child at birth.

At this point, just as the bright idea appeared about to explode around the ears and careers of all concerned, another Do-er took a hand. Today, Burton S. Barr is a colonel in the Arizona Army National Guard. But he was a very junior lieutenant in those days—doing odd staff jobs for Colonel Monroe in his temporary capacity as 3d Division liaison officer at Camp Pendleton. So it took a lot of moxie for him to pay an uninvited, unauthorized call upon the admiral commanding Joint Amphibious Training.

The conference between the daring young lieutenant and the admiral was overheard by Corporal Don Hasting (now a retired major). As gleefully reported by Hasting, the conversation opened something like this:

"Sir, I may be a private in the rear rank tomorrow for coming direct to you like this. But if you'll give me five minutes, we can streamline amphibious operations from training camp to beachhead."

Instead of calling an aide to usher this brash visitor out, the admiral listened. Five minutes lengthened to fifteen and still the admiral listened to facts and figures on the proved merits of the boat-team idea.

Before Do-er Barr left the admiral's office, a repeat performance of the test exercise was scheduled for the next day. This time senior members of the joint staff were assigned as unbiased observers.

Within weeks, the boat-team plan was SOP not only for the Army but for the Marine Corps as well!

TODAY it seems incredible that any other method of preparing and conducting amphibious operations ever was considered. That is always how it seems *after* a good idea is adopted. But beforehand it's the idea that is considered incredible—except by the Do-ers.

Do-ers don't wait for good ideas to come to them. They go out looking for ideas to improve performance. Often the best schemes are found at the working level of operations where invention is spurred by necessity. A famous example is the bulldozer tank—now standard equipment in the Army.

Most of us have heard about the bright sergeant who got the idea for welding a bulldozer blade on the bow of a tank during the Battle of the Hedgerows. He received (and deserves) a lot of credit for it. But what about the unsung hero who said: "Do it!"?

In every field of military progress the vital difference between an abstract idea and a working reality stems from the difference in semantics between "No!" and "Do it!" So whenever we hear a commander credit an Idea Man for a successful innovation, we should divide our admiration equally between them. For it takes positive action as well as inspiration to overcome the mental inertia of habit and custom.

In short, good ideas—like good business—must have buyers to move off the shelf!

Banner Year for Army

The Army's marksmanship improvement program paid off in 1959 with its rifle and pistol teams scoring high in national and international competition

GENERAL BRUCE C. CLARKE

Commanding General, USCONARC

THE 1959 season was the most successful the United States Army has experienced in competition firing. In the All-Army matches and in national and international competition the records established by the U. S. Army were evidence that its marksmanship improvement program is getting results.

First indications of a banner year came during the All-Army matches at Fort Benning during May and June. At that time, teams from all world-wide major commands assembled to compete for the U. S. Army championships. Competition was greater; average scores went higher than ever; records were broken.

The pay-off of the toughened marksmanship training came during the National Matches held, as usual, during July and August at Camp Perry on Lake Erie. This year Army teams competed against the best rifle and pistol shots the armed services and civilians could muster. They won individual honors with the pistol, excelled in the small-bore matches, and proved themselves superior in all matches with the service rifle—the soldier's weapon. Again, our training methods and system of staging competitions, coupled with the soldier's pride in his weapon, paid dividends. All components joined in sharing these national honors: Active Army, National Guard, Army Reserve, and ROTC. The high quality of training demonstrated by all participants validated the One-Army concept. The Army's victories were especially indicative of its promotion of rifle marksmanship in the United States.

From the Perry matches, Army teams went on to international competition, early in September joining U. S. teams in the Pan American Games at Chicago. Here the Army again dominated the field for the U. S., taking home 11 gold medals.

1959 All-Army Matches

At Fort Benning teams representing the six Continental armies, the Military District of Washington, and the Army Air Defense Command, along with others from stations in Europe, Panama, Alaska, Hawaii, and Korea, laid aside garrison and security tasks to shoot it out for the U. S. Army championships on Benning's

Marksmen

On the firing line at the National Matches, Camp Perry, Ohio

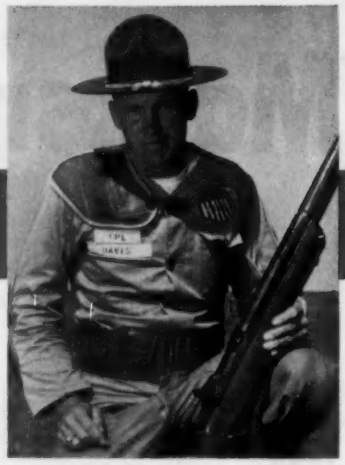
superior ranges. Earlier competition had proved these teams, which had started among companies and batteries, moved up through battalions, battle groups, and divisions to final selection as army area champions.

The U. S. Army Advanced Marksmanship Unit (USAAMU), headed by Colonel Robin G. Montgomery, was on hand to assist these teams through the arduous matches at The Infantry Center. This unit may well be called "U. S. Army Marksmanship Training Command," since it is CONARC's agency for promoting Army-wide competition firing. The coaches, technicians, armorers and shooters who compose this unit organize and train the All-Army national and international squads. Their valuable know-how is offered to every team competing in the All-Army matches. These matches were staged under the same conditions as those of the National Matches.

General Clarke presents Minute Man trophy to two members of the U.S.M.A. rifle team which won high ROTC honors in National Trophy Rifle Team match.

CORPORAL PHILIP T. TOLOCZKO
President's Match winner with Cavalry Cup

CAPTAIN THOMAS W. ATWOOD
National Service Rifle Champion



SERGEANT CHARLES D. DAVIS
National Trophy Individual Rifle Match winner

As a result of the Army's intensified marksmanship program, all teams moved into competition with more talent than in previous years. All matches were hotly contested and several new records established.

Individual and team honors in major events were well distributed among major commands. Corporal Lamonte O. Aslin, from First Army, won the U. S. Army Rifle Championship with 977-114V out of 1,000.

Major Kenneth Dunn, from Fourth Army, captured the Army pistol crown with 2,593-88X. Sergeant First Class John H. Lingle, from Third Army, won the Service Pistol Championship with 863-28X out of 900.

Second Army's squad set new records in winning the Army Rifle Team Championship with 1,468-152V, and so did Third Army's in the Infantry Trophy Match with 996. Fourth Army's team set a new high of 1,130-37X in taking the Army Service Pistol Team Championship. The "New Shooter" award for the pistol went to Private First Class Robert Stoecker, U. S. Army Alaska. The rifle winner was Private First Class William E. Miller of Third Army.

When the All-Army matches were completed, the

NATIONAL TROPHY MATCHES WON BY THE ARMY IN 1959

NATIONAL TROPHY. Awarded to the winning team in the National Trophy Rifle Team Match

U. S. Army Grey. Score 1472-117V out of a possible 1500.
SFC William L. Griffin, Captain, USAAMU
Maj. Raynold Doback, Team Coach, USAAMU
Sp. 5 Robert L. Meeks, U. S. Army Alaska
1st Lt. Frank T. Lohmann, U. S. Army Pacific
1st Lt. Donald R. Schessler, Fifth Army
1st Lt. Thomas W. W. Atwood, USAAMU
SFC Cecil L. Stevens, Second Army
Cpl. Philip T. Toloczko, USAAMU

MINUTE MAN TROPHY. Awarded to the high scoring intercollegiate team in the National Trophy Rifle Team Match

United States Military Academy. Score 1433-95V out of a possible 1500.
Capt. Robert E. Barton, Team Captain
M/Sgt. Oscar L. Gallman, Team Coach
Cadet Calvin R. Johnson
Cadet William R. Ford
Cadet George E. Stanley, Jr.
Cadet James J. Harmon
Cadet Robert L. Phillips
Cadet John H. King

PERSHING TROPHY. Awarded to the high scoring individual in the National Trophy Rifle Team Match
SFC Chester F. Hamilton, Second Army. Score 249-22V.

HILTON TROPHY. Awarded to the high scoring National Guard Team in the National Trophy Rifle Team Match

Hawaii National Guard. Score 1438-91V out of a possible 1500.
SFC Bernard Lee, Team Captain
CWO Ralph K. Apo, Team Coach
Sp. 4 Tom F. Oda
Sp. 3 Myles G. Brown
Sp. 5 Henry H. Yamada
SFC Gabriel P. Moniz
PFC Siegfried R. Azevedo
Sp. 4 Melvin D. Cummings

RATTLESNAKE TROPHY. Awarded to the high scoring Reserve Team in the National Trophy Rifle Team Match

U. S Army Reserve Gold Team. Score 1441-90V out of a possible 1500.
Lt. Col. Edgar B. Nichols, Captain, First Army
Maj. Ray Orton, Team Coach, Third Army
M/Sgt. Theodore B. Benard, Sixth Army

INDIVIDUAL CHAMPIONS WITH RIFLE AND PISTOL

MASTER SERGEANT HUELET L. BENNER
Six-time winner of National Pistol Championship (also three-time World pistol champion)

SERGEANT JAMES H. McNALLY
High scorer in National Trophy Individual Pistol Match

best marksmen were selected to form two rifle and two pistol teams that would represent the U. S. Army in the National Trophy Matches at Camp Perry. Lieutenant Colonels Thomas A. Sharpe and William A. Hancock took charge of these squads. These veteran coaches conducted an intense period of instruction and firing to bring all shooters to their peak of proficiency.

1959 National Matches

Last year, at the National Trophy presentation ceremony at Fort Myer, Secretary of the Army Wilber M. Brucker told me he hoped the Army would do as well in the 1959 National Matches. This year I was happy to report to Mr. Brucker that Army teams had surpassed their 1958 performance.

This was the Army's most successful year since the National Matches were established by act of Congress in 1903. During the early years, participation was limited to the Regular services and state National Guard teams. The National Defense Act of 1916 expanded participation to include civilian teams, and in 1918 the Small Arms Firing School was inaugurated to teach

1st Lt. Frank J. Takach, Second Army
Maj. Samuel C. Burkhalter, Fifth Army
1st Lt. Thomas W. Dennison, Second Army
Major Carl W. Byas, Fourth Army
1st Lt. Henry W. McIlwaine, Third Army

DANIEL BOONE TROPHY. Awarded to the winner of the National Trophy Individual Rifle Match
Sergeant Charles D. Davis, U. S. Army. Score 249-26V.

INFANTRY TROPHY. Awarded to the winning team in the Infantry Trophy Match

U. S. Army Blue. Score 1107 (a new National Record).
Capt. Milo P. Foster, Team Captain, USAAMU
M/Sgt. Clyde W. Burns, Coach, Fifth Army
M/Sgt. Marvin Fitzpatrick, USAAMU
Sgt. Bobby Tubbs, Third Army
SFC Kenneth D. Gilbert, Third Army
Sgt. Norman Skarpness, USAAMU
SFC James L. Tuck, USAAMU
SFC Kenneth Evans, Jr., USAAMU

GENERAL MELLON TROPHY. Awarded to the high National Guard team in the National Trophy Pistol Team Match

California National Guard. Score 1088-27X.
Lt. Col. Merle L. Dailey, Team Captain
Capt. Owen R. Helm, Jr.
Maj. Charles Young
Maj. James D. Benson
Maj. Neville I. Throckmorton

HEARST RIFLE TROPHY. Awarded to the high scoring ROTC student or cadet in the National Trophy Individual Rifle Match

Cadet William R. Ford, United States Military Academy. Score 244-19V.

U. S. COAST GUARD MEMORIAL TROPHY. Awarded to the high reserve team in the National Trophy Pistol Team Match

U. S. Army Reserve Gold. Score 1085-19X out of a possible 1200.
Col. John W. Haines, Team Captain, Sixth Army
Sgt. Karl E. Montstream, First Army
PFC Charles W. Cleveland, First Army
Lt. Col. Edward C. Heuss, Sixth Army
CWO Randolph Aros, Sixth Army

CUSTER TROPHY. Awarded to the winner of the National Trophy Individual Pistol Match
Sergeant James H. McNally, Fourth Army. Score 293-10X.

INTERCOLLEGIATE TROPHY. Awarded to the high scoring ROTC student or Cadet in the National Trophy Individual Pistol Match

Cadet John B. Hubard, United States Military Academy. Score 281-7X.

new and old shooters alike the latest methods in rifle and pistol shooting. This year the school was successfully conducted by Major John F. McNulty, from The Infantry School.

Each year the National Matches are held with the approval of the Secretary of the Army and supervised by the National Board for the Promotion of Rifle Practice (NBPRP) and the National Rifle Association (NRA). The National Board's 25 members are appointed by the Secretary of the Army from all the armed services, the reserve components, the NRA, the Selective Service System, and prominent civilians.

NBPRP establishes the courses of fire and the rules for conducting the National Trophy Matches. These matches consist of individual and team events for both the service rifle and the service pistol, for which trophies with interesting histories are awarded to individual and team winners.

Registrations for the 1959 National Matches were up approximately 20 per cent over 1958. This year 1,761 pistol, 671 small-bore and 2,478 high-power rifle shooters competed, while more than 4,500 enthusiasts attended the Small Arms Firing Schools. Competition, particularly in the Army and Marine Corps, was keen, and frequently record-breaking scores were not sufficient to win a match.

During the Phase I pistol matches, the Army took two major events: the National Pistol Championship and the National Trophy Individual Pistol Match. Master Sergeant Huelet L. (Joe) Benner, pistol coach at the U. S. Military Academy, became the second man in history to win the National Pistol Championship for the sixth time. (The other six-time winner is Harry Reeves, a Detroit police inspector.) Sergeant James McNally, from Fourth Army, took the National Trophy Individual Pistol Match with 293 out of 300. The Marine Corps won the National Trophy Pistol Team Match with Army teams finishing second and third. One of our objectives for next year is to capture this trophy.

Army small-bore shooters won nine matches and established four new records during Phase II. This achievement came while some of our top international competitors were at Fort Benning preparing to represent the United States in the Pan American Games.

The Army's most outstanding triumphs followed during Phase II, in the matches with the service rifle. Army shooters swept all National Trophy events and ended the long-time domination by the Marine Corps. With the service rifle they won the National Individual Championship, the President's Match, three of the five other individual events, and all four of the NRA service rifle team matches. In earning these honors, the Army teams demonstrated great proficiency with the service rifle, especially in the President's Match. The winner of the President's Match, Philip T. Toloczko, a young corporal assigned to the Advanced Marksmanship Unit, captured honors for the second straight year. Last year, as a new shooter, he won the Pershing Trophy with a perfect 250 in the National Trophy Rifle

THIRD PAN-AMERICAN GAMES TEAM AND

RIFLE

FREE-RIFLE (300 meters)

1. 1st Lt. D. Puckel, U. S. A.	1147
2. 1st Lt. T. Pool, U. S. A.	1120
3. J. Giandomenico, Argentina	1096

FREE-RIFLE, TEAM (300 meters)

1. U. S. A.	4491
1st Lt. D. Puckel	1147
1st Lt. T. Pool	1120
PFC G. Anderson	1113
M/Sgt. E. Spradlin	1111
2. Argentina	4317
3. Peru	4040

SMALLBORE RIFLE 3 POSITIONS (50 meters)

1. 1st Lt. D. Puckel, U. S. A.	1107
2. G. Ouellette, Canada	1106
3. PFC G. Anderson, U. S. A.	1105

SMALLBORE RIFLE 3 POSITIONS, TEAM (50 meters)

1. U. S. A.	4436
1st Lt. J. Carter	1121
1st Lt. D. Puckel	1107
PFC G. Anderson	1105
1st Lt. V. Wright	1103
2. Argentina	4302
3. Canada	4271

ENGLISH MATCH (50 and 100 meters)

1. Capt. A. Cook*, U. S. A.	582
2. E. Montemayor, Mexico	581
3. Miss L. Baldwin, Peru	579

ENGLISH MATCH, TEAM (50 and 100 meters)

1. U. S. A.	2317
Sp. 5 M. Gunnarsson	583
Capt. A. Cook	582
2d Lt. P. Kendall	576
1st Lt. J. Eberwine	576
2. Peru	2297
3. Canada	2291

PISTOL

FREE-PISTOL (50 meters)

1. SFC N. Lincoln, U. S. A.	547
2. T. Cabanas, Cuba	538
3. M/Sgt. R. Sutherland, U. S. A.	536

FREE-PISTOL, TEAM (50 meters)

1. U. S. A.	2129
SFC N. Lincoln	547
M/Sgt. R. Sutherland	536
SFC L. Burchett	524
CWO V. W. Maass	522
2. Argentina	2065
3. Peru	2064

team match, distinguishing himself as the first soldier to fire a possible in a National Trophy Match. Sixty-six soldiers of the Active Army, four from the Army Reserve, two from the Army National Guard, and one USMA cadet won the right to wear the "President's Hundred" patch.

As an appropriate finale, the Army repeated its 1958 victory in the National Trophy Rifle Team Match by taking the first four places. In the last match for the coveted Infantry Trophy, the Army bettered its former record by 106 points and outscored the top Marine Corps team by 122.

Army Reserve teams made an impressive showing by winning the Reserve Corps Championship in the National Trophy Pistol Team Match and National Trophy Rifle Team Match, the High Reserve in the National Trophy Individual Pistol Match, and the National Reserve Individual Pistol Championship. They placed the high reservist, First Lieutenant James M. Bailey, from Hawaii, in the President's Match.

The Hawaii National Guard Team, by repeating last year's impressive victory in the National Trophy Rifle Team Match, was again awarded the Hilton Trophy.

The U. S. Military Academy team captured the Minute Man Trophy for the highest-scoring national intercollegiate military rifle team.

All National Trophy matches are fired with the service rifle or the service pistol. The NRA events in the program include matches with the caliber .22, center fire and caliber .45 pistol, small-bore rifle, and high-power rifle. In the high-power rifle field, there are matches for both bolt-operated and service rifles. The Army enjoyed its greatest success in the service rifle events.

INDIVIDUAL PLACE WINNERS

RAPID-FIRE PISTOL (25 meters)

1. 1st Lt. D. Cartes, U. S. A.		584
2. SFC A. Smith, U. S. A.		573
3. G. Cornejo, Peru		571

RAPID-FIRE PISTOL, TEAM (25 meters)

1. U. S. A.		2309
M/Sgt. R. Stineman	586	
1st Lt. D. Cartes	584	
SFC A. Smith	573	
M/Sgt. R. Ratliff	566	
2. Peru		2237
3. Argentina		2235

CENTER-FIRE PISTOL (25 meters)

1. SFC A. Smith, U. S. A.		569
2. O. Cerve, Argentina		569
3. G. McMahon, Canada		568

CENTER-FIRE PISTOL, TEAM (25 meters)

1. U. S. A.		2266
M/Sgt. R. Stineman	585	
SFC A. Smith	569	
1st Lt. D. Cartes	567	
M/Sgt. R. Sutherland	545	
2. Venezuela		2214
3. Puerto Rico		2213

*Member USAF Reserve. All other U. S. competitors were members of the U. S. Army.

Army versus Marines

National Matches competition has always been stimulated by friendly rivalry between Army and Marines. Each service directs its training efforts toward winning the national rifle and pistol championships. I am convinced that this built-in challenge to each service is a healthy factor in improving marksmanship training and in enhancing combat readiness. In the years to come, a third service, USAF, will have to be reckoned a real contender for national honors. The Air Force has inaugurated a fine competitive program and this year it established a new record while winning the caliber .22 Pistol Team Match.

Excellence in competition marksmanship at the national level is not an end in itself, but the collateral benefits are considerable. The prestige gained by the shooter and his unit, the experience, confidence and knowledge gained through marksmanship competition, can be obtained in no other way short of combat.

Marksmanship competition during basic combat training gives the soldier an opportunity to distinguish himself among his comrades. It may be hard to tell exactly who salutes best, who keeps his uniform neatest, or who marches most precisely. But when it comes to shooting, scores speak for themselves and leave no doubt as to who is best. The record shows that Army training methods have brought results.

International Competition

International competition offers another challenge to the U. S. Army as a stimulus to marksmanship training proficiency. During the Pan American Games, from 27 August to 7 September, shooters from 16 American republics competed at Waukegan, near Chicago. This was the first international shoulder-to-shoulder rifle and pistol competition held in the United States in more than three decades. The Army more than met its commitment, since 19 of the 22 members comprising the U. S. teams were soldiers. All came through the Advanced Marksmanship Unit. The U. S. squad tryouts were held at Benning during June and August.

The next important international competition will be held in Rome during the 1960 Olympic Games. To assist the United States in fielding strong teams, this year the Army must increase its emphasis on its competition marksmanship program.

During the 1958 International Matches held in Moscow, there were 26 soldiers on the U. S. team which could win only five gold medals. In analyzing the results of the 1959 Pan American matches and comparing them with the 1958 World Championship Matches in Moscow, we found that we were especially strong in the 300-meter free rifle event. First Lieutenant Daniel B. Puckel won this year's 300-meter free rifle champion-

General Lemnitzer presents trophy to U. S. Army Gray rifle team which won the Dogs of War Trophy at National Matches.

General LYMAN L. LEMNITZER

***Chief of Staff, U. S. Army*, speaking of Marksmanship and National Survival—**

> The traditional hallmark of the American fighting man has always been fine marksmanship. It is very important that a man armed with a rifle or pistol know how to use it. It gives him confidence, it stresses precision of performance and in many cases his life depends on whether he can use that weapon or not.
>
> Those of us who are responsible for some of our security activities still believe the rifle, pistol and the ability to use them represent a very important factor in our survival because, notwithstanding the introduction of all the new and glamorous weapons, we still believe that the ultimate objective of warfare is to take, hold and control land and the people who live on that land. And, though the newer weapons contribute a great deal to the accomplishment of that, in the final analysis the job is done by the man on the ground with his rifle.

---

ship in Chicago and paced the U. S. team in a victory which was 22 points higher than the average score turned in by the USSR at the 1958 Moscow matches. We must exert special effort in Army training if we are to improve our chances of winning small-bore and pistol matches.

I consider the success demonstrated by all Army personnel in the rifle and pistol matches during the Pan American Games to be an indication of a banner showing by U. S. teams when they compete for the world championships next year in Rome.

The Outlook for 1960

Our objectives for 1960 must be even higher if the Army is to retain its supremacy in competition marksmanship. I think we should start now, in training centers, companies and batteries, to intensify pistol, small-bore and rifle marksmanship training. This should be the focal point of all our efforts to discover and earmark all potential shooters for later Army competitions.

At the earliest opportunity we must ready the Army's international shooters for tryouts in the 1960 Olympics. The Army Advanced Marksmanship Unit is already selecting and training shooters for these events. It stands ready to assist, as practicable, all major commands in achieving the Army's 1960 objectives.

The 1960 National Matches will be held again at Camp Perry. In this connection, the National Board for the Promotion of Rifle Practice has decided to reduce the number of all-service teams competing in the National Trophy Team Matches from two to one. In keeping with the spirit of this ruling, CONARC has notified the National Board that the Army will reduce its participation in the National Trophy Team Matches by consolidating into a regional organization after the 1960 All-Army Championships. Therefore, we plan to enter the three National Trophy Team Matches with this organization: One All-Army team, and one team from U. S. Army Eastern Region (Military District of Washington, First, Second, Third Armies, U. S. Army Caribbean); U. S. Army Western Region (Fourth, Fifth, Sixth Armies, U. S. Army Alaska); U. S. Army Air Defense Command; U. S. Army Europe; U. S. Army Pacific. This change will not affect the entry of National Guard or Army Reserve teams.

IN the field of competition shooting 1959 has been unique for the U. S. Army. Our marksmanship program is a facet of the One-Army concept. It is as much a part of the Army National Guard, the Army Reserve, and the citizens of our country as of the Active Army. It is part of our national defense effort and of our country's security. It is evident that marksmanship is very important in our military training. The ground soldier with his rifle is the backbone of our combat forces—the focal point of all our efforts. He is the reason for a U. S. Army today. Records made by U. S. international teams indicate to the world the state of our combat readiness. In order to reestablish the United States as a leader in international and Olympic matches, it is essential that we of the Army take the initiative in training competition marksmen who can be expected to qualify for the Olympic and international rifle and pistol squads. The prestige of the United States in these competitions rises or falls with the ability of Army marksmen, for no other Government agency is organized or equipped to carry out this mission. The unprecedented performance of Army marksmen in this year's National Matches and Pan American Games proves that no other has such a wealth of shooting talent.

Deep Penetration Parachute Patrols

Major JOHN M. COLLINS

Joint Army-Air Force maneuver at Fort Bragg tests a theory: hard-hitting, long-range parachute patrols can seriously disrupt enemy operations in advance of major assault. Despite many problems, the results indicate the idea is basically sound.

AT dusk on 3 June a parachute canopy blossoms in the lightning-swept skies over Fort Bragg, quickly followed by three others. The four drift earthward toward a postage-stamp drop zone among the Carolina pines. A half score of similar patrols had been dropped from Army fixed-wing aircraft shortly after daybreak. The first Air Force-delivered deep penetration parachute patrol is on its way in support of the 82d Airborne Division's assault that is to be launched at 0001 on 4 June.

The concept of using small, highly motivated, long-range parachute patrols in conjunction with the establishment of an airborne division airhead was projected by Major General Hamilton H. Howze, then commanding the All-American. This concept holds that compact, hard-hitting units dropped in the enemy's rear a few hours to a few days before P-hour can create an infinite amount of mischief in addition to gaining vital information for the task force assault elements. And they can still live to fight another day. General Howze chose Phase III of Exercise Dark Cloud, a joint Army-Air Force maneuver held at Fort Bragg from 23 May to 9 June 1959, to test this innovation.

The division's mission was concisely stated: "82d Airborne Division executes airborne assault beginning P-hour, D-day, to effect maximum destruction of Aggressor forces in the Bramac Strip and to reestablish . . . control of the area. . . ."

In weaving the long-range patrol plan into the division's scheme of maneuver, G2 (with G3 in close coordination) worked out in infinite detail a program based on the commanding general's directive. Patrol missions were formulated, drop zones and objective areas selected, drop times designated, delivery methods determined, and appropriate airlift arranged.

The division's mission pitted its lightly armed paratroopers against tank-infantry teams. Because these teams are the most dangerous foe of the airborne, patrol planners organized specially armed and equipped tank-killer and harassing patrols. These were to seek, find and destroy as much of the enemy's armor as possible before first light on D-day.

Organization and orders

By a process of elimination, the planners finally selected 34 patrols totaling 141 troopers. Seven tank-killer patrols were spotted at key points along avenues of approach into the task force drop zones; a total of 19 harassing patrols were assigned areas, rather than points, of operations; four demolition patrols were instructed to destroy all bridges vital to Aggressor but not essential to our division; each of two patrols would establish a pair of observation posts overlooking key terrain and enemy lines of communication; one Army Security Agency team was to initiate radio intercept operations; a signal patrol would open a radio relay station.

These patrols consisted of four men, except the ASA and demolition groups, each of which had five. In addition, six dummy drops were mounted in an effort to deceive Aggressor concerning the exact number and location of our patrols at work behind his lines. The composite patrol plan encompassed an area of the enemy's territory roughly 30 miles wide and 12 miles deep.

The 82d Aviation Company, directed by the division aviation officer, was designated early in the game to obtain aerial and ground photographs of all objective areas and appropriate cardtable-sized drop zones. At least one vertical and one high-oblique shot were required, scale 1:5,000 or larger, in addition to four to six ground shots from several angles. These photos simulated the type of coverage compiled by military and air attachés and other intelligence collection agencies. More than 70 separate flight missions resulted in 400-odd photographs, all of which were annotated meticulously by experts of the 82d MI Detachment. For demolition patrols, the 307th Engineer Battalion drafted three-dimensional sketches showing proper placement of charges and the types and amounts of explosives required.

Then a sample patrol order brochure was prepared by the G2 Section. This was reproduced and distributed to all battle groups after approval by the division commander. All orders for the 34 patrols were based on this

---

Major John M. Collins was Assistant G2 of the 82d Airborne Division when he wrote this article. He has served as G2 Plans Officer for XVIII Airborne Corps. He earned his Master's degree in military geography at Clark University, Worcester, Mass. Major Collins was recently assigned to Greenland.

Patrols dropped from both Air Force troop carrier planes (left) and Army aircraft (right). New tech-

model. Orders for battle groups were written by group S2; those for ASA and radio relay patrols by the division's G2 section. Orders were drafted, refined and redrafted with attention to minute detail. They were then reviewed by a caustic and intolerant G2. Most of them were finally approved by the division commander. Each brochure included the written order, fully annotated aerial and ground photos, a 1:25,000 map of the area of operations and, for some units, sketches of the objective area.

Patrol leaders were personally directed to jump with a complete brochure in their possession, on the commanding general's premise that benefits gained from explicit instructions far outweigh the accompanying potentiality of security compromise. All data concerning points of reentry to friendly lines, passwords, division radio frequencies, and other matters affecting the division's security were issued orally, and appeared nowhere in the order. Nevertheless, capture by Aggressor of a trooper with the order would alert the enemy to patrol objectives. Almost certainly this would preclude accomplishment of that patrol's mission, even though all other members of the patrol continued on to the objective. This was a risk the division commander was prepared to assume.

G2 also provided each S2 with a comprehensive patrol checklist of methods desired in briefing the patrols, and a second checklist for interrogating them at the conclusion of the patrol mission. A third checklist was prepared for use by patrol leaders.

All had their troubles

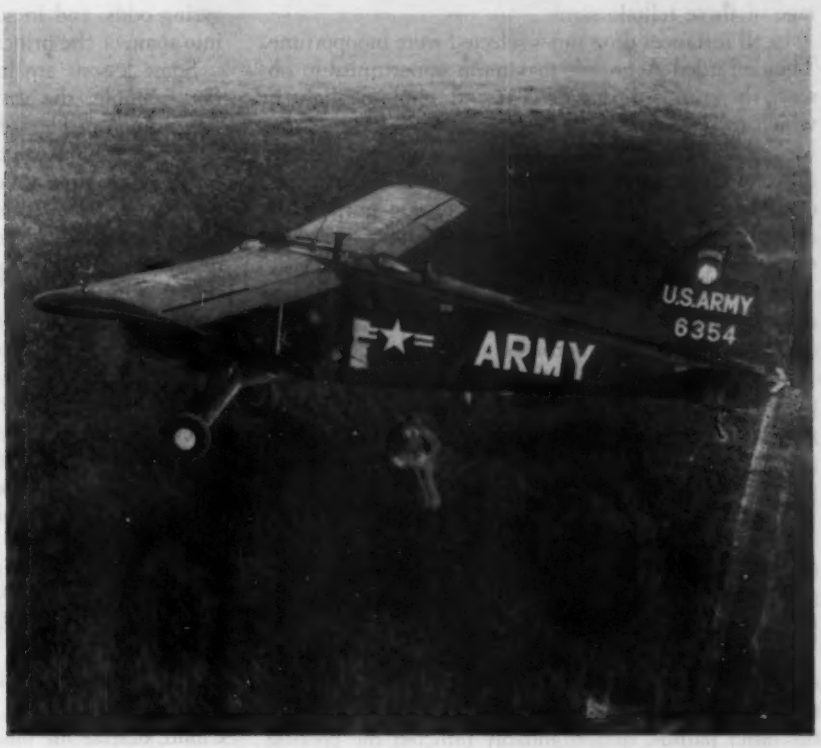
Conditions under which the test was launched were somewhat less than ideal.

The patrols assigned to CT 1/325 were scheduled to drop from Army U-1A (Otter) fixed-wing aircraft beginning 0430 on 2 June, 30 minutes after beginning of morning, nautical time (BMNT). Because of a 24-hour weather delay and subsequent postponed weather decision, the patrols were actually committed beginning at 0715 on 3 June—3 hours 15 minutes after first light.

Of these patrols, nine had harassing missions and one was to install two observation posts. Unfortunately, all ten were compromised completely before they even reached the departure airfield. Aggressor's snooping in division trash containers was rewarded with a pencilled draft revealing the size and mission of the patrols, drop times, drop zones, and delivery methods. The enemy disposed his forces accordingly. As a result, nine of the ten patrols found Aggressor waiting at the prescribed drop zones. Thirteen of the patrol's 40 members were captured upon landing—roughly one third of the total patrol strength delivered by Army aircraft. However, one happy light shone through this otherwise dreary experience: Under these conditions, Army aircraft exhibited considerably more flexibility than Air Force transports by affording the jumpmaster a fielder's choice, thus enabling four patrols to avoid areas infested with Aggressor.

Twenty-four patrols scheduled to drop from three Air Force C-123 aircraft at 1900, 1910 and 1920 hours,

niques of delivering parachute patrols are needed and tests of high performance aircraft are desirable.



respectively, on 2 June, actually dropped during a thunderstorm at those times ten days later. (It was reminded of that memorable early morning in June 1944 when assault echelons of the 82d Airborne Division parachuted into Normandy.) Six patrols aborted because of inclement weather. For the first aircraft, the time was 1 hour 29 minutes before end of evening, nautical time (EENT), and for the third, 1 hour 9 minutes.

Last-minute details were checked and double-checked in the marshaling area by a veteran patrol expert. Most of these night patrols were assigned equitably to the 1st Battle Group of the 187th Airborne Infantry, the 2d of the 501st, and the 1st of the 503d. One came from the 82d Signal Battalion and one from the 317th Army Security Agency Battalion.

One patrol, from CT 1/503, landed in Aggressor's territory and was immediately gobbled up. Others dangled helplessly from trees while the enemy policed them up at leisure. All in all, 31 of the 76 troopers dropped on the evening of 3 June were captured at the drop zones. These represented roughly 41 per cent of the total patrol strength delivered by Air Force aircraft.

Certain additional factors helped confirm plans which fell into Aggressor's hands or contributed to the failure of the patrols in some other way.

The enemy knew too much

Aggressor for Exercise Dark Cloud (2d Battle Group, 503d Airborne Infantry), drawn from the 82d Airborne Division, thoroughly understood the division commander's concepts and methods of operation, and so planned accordingly. Security of "classified" information was unrealistically difficult because friendly and enemy camps were established in the same cantonment area. However, the use of airborne troops as Aggressor insured that the division's foe had full knowledge of tactical methods best suited for anti-airborne operations. Aggressor mobile patrols were numerous, and were so disposed as to provide an effective defense against small paratrooper forces. Perhaps most important of all, Aggressor had participated in small-patrol training with the rest of the division immediately before Exercise Dark Cloud, thus gaining foreknowledge of the types of patrols they might encounter, the probable tactical methods that would be employed, and intimate knowledge of at least 10 potential drop zones which subsequently were used during the exercise.

On 1 June, Air Force aircraft rehearsed the identical flight plan of the small patrols at the precise time of day those parachute patrols were to be introduced on D minus 1. This maneuver was calculated to heighten the suspicions of Aggressor, who was already aware that small parachute patrols were likely to be committed. Security was further compromised by an administrative requirement that all drop zones be marked by white smoke three minutes before drop time, and that a radio-equipped vehicle and umpire be available at each site. Medical support also was directed to be at or near the drop zones. Needless to say, Aggressor took full advan-

tage of these telltale signs.

In all instances drop times selected were inopportune. They afforded Aggressor maximum opportunity to observe the patrols during descent and ample daylight in which to seek, find, and destroy them on the ground. Moreover, daylight drops helped the enemy identify areas of special interest to the division. Nevertheless, daylight jumps were scheduled for testing purposes in an effort to land the greatest number of patrols discharged on the correct drop zones.

Lack of maneuver space caused the division to violate one of its own cardinal principles. As outlined by General Howze: "[Under normal conditions] these patrols would be dropped in rear areas specially selected for low probability of Aggressor combat unit activity. . . . Aggressors rarely would be in position to throw squad- and platoon-sized units promptly against the patrols." In point of fact, no real rear area existed, and many patrols jumped over the heart of the enemy's stronghold.

Despite all difficulties, some of the patrols were spectacularly successful. This is remarkable indeed, considering the detailed information available to Aggressor prior to the drops.

Those patrols which survived the initial landings chalked up an impressive record of hell-raising behind enemy lines. CT 1/325, jumping 12 hours ahead of the other patrols, understandably inflicted the greatest number of casualties. One harassing patrol armed with sticky mines and Energa grenades claimed credit for two medium tanks, seven quarter-ton trucks, a 2½-ton truck, and 56 Aggressor dead. Another claimed three medium tanks, three quarter-ton trucks and 13 enemy killed. Still another asserted it destroyed six quarter-ton trucks, two ¾-ton trucks, four 2½-ton trucks, a five-ton wrecker, and 36 Aggressors. Demolition patrols were particularly effective. Three of the four succeeded in destroying their assigned objectives and remained to harass Aggressor forces. Strangely enough, five of the seven tank-killer patrols were completely ineffective, none accounting for a single tank. Two aborted because of inclement weather, and three were destroyed on the drop zones.

Unfortunately, the most extravagant claims cannot be substantiated, although there may be little reason to doubt their validity. Major General William C. Westmoreland's 101st Airborne Division provided elaborate umpire support for the deep penetration parachute patrols. All were products of the 101st's RACONDO (Ranger-Commando) School at Fort Campbell. In practice, however, many patrols failed to join up with umpires waiting on prescribed drop zones, or lost them in tangled undergrowth during hours of darkness.

Lessons of the test

We acknowledge that the 82d Airborne Division's experimentation during Exercise Dark Cloud with long-range parachute patrols hardly represents a valid test of the concept. Even so, nearly one third of the patrols succeeded in accomplishing their missions against staggering odds, and in so doing afforded valuable insight into some of the principal problems involved.

Some lessons are in the purely administrative field. For example, the division certainly hopes to oppose straightleg outsiders during its next large-scale test of deep penetration parachute patrols. Smoke on the drop zones before drop time, required solely to mark release points and not intended as a safety measure, should be eliminated. Medical support could be held in convenient reserve, on call by patrol radio. And there is little question that in the future umpires should join their respective patrols in the marshaling area and jump with them to insure constant close contact. Flight-plan rehearsals should be staggered so as to avoid disclosing critical information to the enemy.

The operational lessons learned are more important. Commanders and staffs alike generally agree that patrols should be dropped at night, under an obscured moon if possible, to take full advantage of the passive security thus afforded. Patrols habitually should be programmed for interdiction in Aggressor rear areas. If their employment in territory strongly held by the enemy is unavoidable, patrols should be delivered elsewhere and move overland to their objectives.

The intelligence collection capabilities of long-range patrols were largely ignored during Exercise Dark Cloud, despite the obvious fact that they could provide vital information the task force commander could obtain through no other source. Future experiments will involve a much greater proportion of intelligence patrols equipped with appropriate communications means. Sufficient radio relay patrols will be provided to limit nets to eight stations or less.

From the standpoint of counterintelligence, two important points emerge.

General Howze felt that "both Army and Air Force patrol delivery aircraft should practice the technique of low-level [100 feet] approach, rapid climb to jump altitude, and immediate discharge of parachutists." Conversely, a very high approach, followed by a steep glide to jump altitude, might serve a useful purpose. The 82d Airborne Division is anxious to study delivery of parachutists from high-performance aircraft in the hope that findings may be applied to deep penetration parachute patrols.

Secondly, it seems likely that patrol members should follow the conventional SOP, committing instructions to memory and leaving written orders, annotated maps, and photographs in the marshaling area.

All in all, we feel that the results of our small, long-range patrol test during Exercise Dark Cloud are gratifying. Enough patrols came through to cause serious disruption in the enemy's rear, despite the multitude of factors working against them. During the critique the division commander expressed his personal opinion, which is also reflected by his commanders and staff: "I remain convinced that the idea is basically very good, and warrants continued development."

Future tests will tell.

THE MONTH'S CEREBRATIONS

A NEW DECLINATION DIAGRAM FOR ARMY MAPS

A substitute for the old-style diagram on tactical maps

JACOB SKOP

The tactical map is an important piece of military hardware. It is indispensable at all echelons and to all arms and services and in every phase of the planning and execution of military operations.

The military maps published by the Army Map Service are generally well regarded by their users and are generally accepted as adequate for the purposes of the users. A map, however, is not static and must be subjected to almost constant improvement. To attain its maximum effectiveness, the content and design of the map should be made to satisfy all the essential requirements of its many military users. The map should show only those features, in appropriate amount, which are pertinent to the users' requirements. Extraneous data should be omitted. The features should be plotted with the degree of engineering accuracy that is compatible with the users' needs.

The symbols used should be bold and simple, affording ready user recognition under the most adverse field conditions, and with emphasis in design and color being proportionate to the features' relative importance to the users. The supplementary aids and information in the margin of the map also should be only those that are required and should be designed to be both as effective and as self-explanatory as possible. There can be no finality, however, to the accomplishment of these objectives since changing military practices engender changing mapping needs. Only through continuous contact with military map users can these current and future needs be determined and translated into terms of map improvement.

For the past several years, the Army Map Service has been actively engaged in asking military map users what they want in a map. Many user requirements surveys have been conducted on an Army-wide basis at representative military installations, not only in the United States but also in the overseas theaters. Much has been learned; much remains to be learned. At this point, it is apparent that there are many areas of possible improvement. Rather than waiting until some distant date to effect a one-time wholesale improvement to the map, it is felt that map users will be better served if improvements are applied from time to time, as their merits become evident. One such recent change is an improved declination diagram.

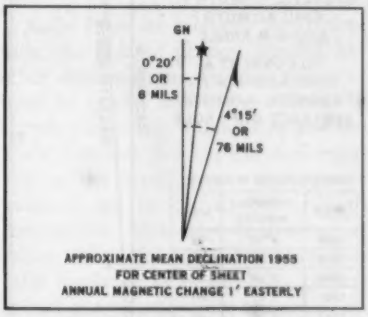


Figure 1. Old Style Declination Diagram

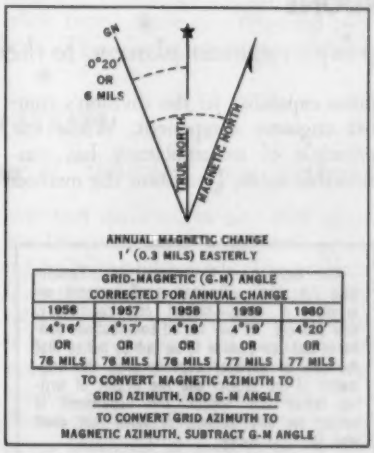


Figure 2. Preliminary Prototype Declination Diagram

During 1955 and 1956, the Army Map Service conducted a comprehensive Army-wide survey to determine user requirements for large scale maps. One very common complaint volunteered by map users was that the currently used declination diagram presented many difficulties in interpretation, which resulted in numerous errors in converting between magnetic and grid azimuths. Corroborative evidence substantiating the existence of a serious problem area was found through the examination of consolidated results of map reading tests given to students (both officers and enlisted) by several of the service schools. Statistics of one group of commissioned officers were typical: 82 per cent failed on problems involving the conversion of magnetic azimuths to grid azimuths. Analyses of these and similar data indicated a deficiency in an important tactical area sufficiently serious to warrant a thorough investigation.

An examination was made into the reasons for errors resulting in translating between magnetic and grid azimuths. Study was concentrated solely on the diagram and its involvement in computations. Human errors resulting from incorrect use of the compass were not considered.

Here are the reasons for the majority of errors in converting between magnetic and grid azimuths:

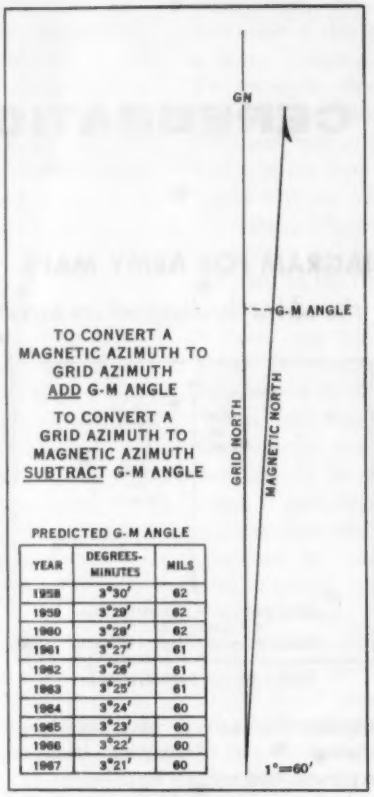
- Adding the magnetic-grid angle when it should have been subtracted, and vice versa.
- Using the grid-north angle in computing instead of using the magnetic-grid angle.
- Improper consideration of annual magnetic change, both in arithmetic (allowing for proper number of years between date of diagram and date of computation) and in application (adding the total change when it should have been subtracted, and vice versa).

• Errors in arithmetic.

Following this study, the Army Map Service devised a prototype declination diagram, the design of which was aimed at removing these causes of error.

The survey to evaluate the prototype declination diagram initially was conducted within the continental limits of the United States among a representative cross section of U. S. Army users of military maps. Additional data were collected through similar surveys in the European and Far East theaters and of marines in the United States and the Far East. The questionnaire used in the survey was unusual in that instead of direct questions seeking facts it consisted of four conversion problems. The respondents were first given a sheet containing the problems keyed to the standard declination diagram (*Figure 1*). On completion, the papers were collected and a second problem sheet keyed to the prototype diagram (*Figure* 2) was distributed to the same people for completion. Examination of the results not only revealed the extent of deficiency of the old style diagram, but also allowed an evaluation of the prototype diagram. The consolidated results showed that with the use of the old diagram the average of correct answers to the problems of 1,556 respondents was 34.77 per cent, with an average of 2.11 minutes required to complete each problem. Using the prototype diagram in conjunction with solution of the problems, the average of correct answers to the problems made by the same respondents was 82.74 per cent, with an average of 1.31 minutes required to complete each problem.

The survey unquestionably verified the existence of a serious deficiency. At the same time, the increase in effectiveness from 34.77 per cent to 82.74 per cent definitely established the superiority of the prototype declination diagram over the old declination diagram.


GN
G-M ANGLE
TO CONVERT A MAGNETIC AZIMUTH TO GRID AZIMUTH ADD G-M ANGLE
TO CONVERT A GRID AZIMUTH TO MAGNETIC AZIMUTH SUBTRACT G-M ANGLE
GRID NORTH
MAGNETIC NORTH
PREDICTED G-M ANGLE
1°=60'

YEAR	DEGREES-MINUTES	MILS
1958	3°30'	62
1959	3°29'	62
1960	3°28'	62
1961	3°27'	61
1962	3°26'	61
1963	3°25'	61
1964	3°24'	60
1965	3°23'	60
1966	3°22'	60
1967	3°21'	60

Figure 3. Newly Adopted Declination Diagram

To further determine the effectiveness of the prototype diagram and to determine its impact on training, the same tests were given to men who had limited or no actual experience in the field use of the declination diagram. Tested were a group of 616 cadets at the United States Military Academy and a group of 293 basic trainees at Fort Carson, Colo. The results again were revealing. Using the old diagram, the average of correct answers to the problems made by the West Point cadets was 66.58 per cent; using the prototype diagram, the average of correct answers rose to 94.64 per cent. Using the old diagram, the average of correct answers made by the Fort Carson trainees was 36.96 per cent; using the prototype diagram, the average of correct answers rose to 63.15 per cent.

Following the survey, a study was made of the incorrect problem solutions (17.26 per cent) involving the use of the prototype declination diagram. The analyses of the causes of error and consideration of the many comments and suggestions volunteered by the surveyed respondents resulted in a new declination diagram (*Figure* 3) which should be almost letter perfect. This diagram has been adopted for use by the U. S. Army and, as expeditiously as possible, is being substituted for the old style diagram on U. S. Army military maps of the tactical category. During the transition period, of course, the map user must retain familiarity with use of the old style diagram. Eventually, however, "if you can read, you can convert magnetic-grid azimuths."

***Jacob Skop** is Chief of the User Requirements Division, U. S. Army Map Service.*

FRAGMENTATION OVERDONE

Return the battle group's engineer platoons to their battalion

LT. COL. D. A. RAYMOND

A KEY principle we followed in developing the organization of the Pentomic division was that of building in a maximum degree of self-sufficiency that would enhance its capability for semi-independent operations. Following this principle, a maximum of arms and services was assembled within the battle-group structure: infantry, armor, artillery, cavalry, combat engineers, signal, and medical units.

Adherence to this principle has resulted in considerably less than optimum capability in the division's combat engineer component. While the principle of self-sufficiency has considerable merit, I question the method of achievement. What has been attained by table of organization could better have been accomplished by organization for combat. By returning the engineer platoons now organic to battle groups to the engineer battalion, the engineer capability of the division and the battle groups would be significantly increased. Correction of this organizational deficiency is overdue.

The basic elements of combat engineer strength in the infantry division are the 15 engineer line platoons, only 10 of which are in the engineer battalion, while five belong to the bat-

This department is designed to accommodate the short, pithy and good humored expression of ideas—radical and reactionary, new and old. We pay for all contributions published but you deserve to be put on notice that the rate of payment depends upon the originality of the subject and the quality of writing rather than length. This department is hungry for contributions, so shoot that good idea in . . . today.

tle groups. This distribution of platoons has a splintering effect on the division's engineer capability and decreases its effectiveness significantly, both with the division and in the battle groups.

This current ineffectiveness of the battle group engineer platoons stems directly from their organizational isolation. These platoons lack the support and the diversity of capability found in platoons which are organic to engineer companies and in turn organic to the engineer battalion. The capability of these organizationally isolated platoons has been decreased just as would happen in rifle platoons were they not organic to rifle companies or in turn not organic to a battle group.

Just as the rifle platoon depends for maximum effectiveness on a successively higher unit of which it is an integrated part, so does the engineer platoon. Thus the engineer platoon organic to the battalion gets backup from the company, while the company in turn is backed up by the battalion. So the maximum engineer capability in the division is realized from the battalion as a whole. It is the engineer platoon which is supported by company and battalion equipment, communications, reconnaissance, planning, supervision, leadership, and logistical support which has maximum effectiveness—not the isolated platoon.

The obvious question may well be asked: Why cannot engineer company and battalion support be made available to these isolated platoons so as to enhance their effectiveness? The answer is simple: these platoons are too inadequate in organization, equipment, experience, and personnel to employ the resources of the engineer battalion which could be made available to them.

In normal practice a single engineer platoon can render only token support to a battle group, and the support mission habitually devolves on an engineer company. When such support is made available to the battle group, it usually becomes necessary to attach the battle group engineer platoon to the supporting company. In essence, when a battle group undertakes an operational mission, its organic engineer platoon must be replaced by a full company.

Aside from its inherent ineffectiveness, the isolated platoon concept has other disadvantages. Its own resources limit its special training to essentially simple pioneering, demolition, and obstacle exercises. Any expansion of training in the broad scope of engineer missions can be carried out only in conjunction with the engineer battalion. Also, the isolated platoon has little flexibility of opportunity in personnel assignment, advancement or diversification. Further, one can argue that in an isolated platoon morale and even unit spirit are less than what they should be.

From the battalion's viewpoint, there is an additional disadvantage in splitting five of the 15 platoons away from the basic engineer element of the division. Basically, the battalion is now top-heavy in overhead-type organizational elements. Headquarters in five lettered companies, with necessary elements for command, administration, maintenance, supply, mess, communications, and equipment support are excessive for the operations of only 10 platoons. Yet five company headquarters are essential in order to simultaneously support all five battle groups when they operate in a dispersed pattern. This disproportionate overhead element becomes exceptionally high and apparent when any understrength occurs, for when all overhead, functional equipment, and vehicle requirements are met, the understrength generally is suffered in the line platoons. Yet a lettered company headquarters could, with only minor adjustment, easily suffice for three or even four line platoons.

The deficiency in the engineer element of the current infantry division can be resolved simply by dropping the engineer platoons now organic to the battle groups and in turn placing three platoons in each of the five lettered companies of the engineer battalion. The returns in division-wide increased engineer effectiveness and, thus in combat capability, would be immeasurable.

Battle groups would be assured of optimum engineer support by well-trained engineer elements backed up by successive echelons of capability and effectiveness. Throughout the division, maximum flexibility and economy in engineer support would result. Assignment and advancement opportunities would be equalized for all engineer troops in the division. The current overhead in the engineer battalion would no longer be disproportionately high. The total engineer capability of the division would be available for massing when required. Engineer training within the division would be standardized and simplified. Responsibility for all engineer support and effectiveness would be in the hands of the division engineer.

Lieutenant Colonel Daniel A. Raymond, Corps of Engineers, *recently engineer of the 7th Division in Korea, is Deputy District Engineer, U. S. Army Engineer District, Okinawa.*

DOWNGRADE DIVISION STAFFS

Reduce the number of "thinkers" by using more noncommissioned officers

MAJOR THOMAS W. BOWEN

STAFFS are rapidly becoming like the weather: everyone talks about them but no one does anything about them. True, many of our best commanders issue directives to "cut the staffs to the bone," or "get all headquarters to TOE by 1 June," or "reduce all headquarters by ten per cent across the board." Yet each month finds new staff centers, new staff divisions, or new staff agencies being formed and our staffs growing by leaps and bounds. The problem is an extremely serious one. It not only robs the lower units of officers needed to run them properly but, perhaps even worse, the reaction time of staffs has become so lengthened that many pertinent questions from lower units are never answered in time to be of use.

This constant expansion and upgrading of staffs at all headquarters results primarily from two fallacies. First, the belief that no one staff officer can handle more than one specific function. If we put him in charge of more than one endeavor, the proper procedure is to give him two officer assistants and let him "supervise" them. It seems that the approved method for solving any specific coordination problem is to have under the same tent

everything and everyone connected with it. In short, create another center, regardless of the fact that this leads to another set of clerks, duty officers, and communications equipment—not to mention increase in transportation, mess, and supply.

The second fallacy is that only an officer is qualified to answer the radio, record messages, and even, at some headquarters, post the situation map. So we have an O-4 doing the work of an E-4. Everyone knows that there is an "officer slice" as well as a "division slice." The only question is of its exact size. So by employing officers in clerks' routine jobs, we increase the support in numbers and types required in the headquarters element.

I think a simple solution is to lower by one grade all staff officers in infantry division headquarters, and replace lieutenant colonels in the primary general staff jobs with majors. In the G3 section, for instance, the immediate result would be the placing of captains in the executive officer's slot and as heads of subdivisions. If a division headquarters is forbidden to employ lieutenants on its staff—and it should be—we will find the officer strength approaching TOE. The principal assistants of the captains should be noncommissioned officers. If you say such a staff would not be sufficiently mature, I point out that a staff's function is to do the pick-and-shovel work for the commander and to prepare recommendations, not to command the units. The lowered rank among staff officers would have a very constructive effect on the subordinate unit commanders, demonstrating that the staff is there to assist the commander and aid the units and not to instruct his subordinates in doing their jobs.

To the charge that it would be impossible to operate twenty-four hours a day in the field with such a reduced staff, I reply that the system of reduced rank staff would put enlisted men back in charge of the routine operational jobs which were designed for them. The use of a noncommissioned duty officer would certainly carry with it some of the "prestige" and "responsibility" we talk so much about. The operation of the staff would increase in efficiency since the same enlisted personnel would be working at the routine jobs all the time. We would avoid the confusion of breaking in a new bunch of captains and lieutenants robbed from lower units for each field problem. We would also reduce the number of reports not actually required, for we would need no officers in charge of any one report, or to harass the subordinate headquarters about it. If you think this structure is too lean for operations, I point to the German and British staffs which operate a larger division with approximately 42 per cent and 35 per cent, respectively, of the officer strength of our division. These divisions are considered well staffed.

The other major benefit of the staff reduced in rank and size is the lowering of reaction time. Currently, the specialist on the radio takes the message to the sergeant in charge of supervising radios, who takes it to the lieutenant in charge of incoming messages, who takes it to the captain who is duty officer, who takes it to the major who is on call, who takes it to the executive officer who must be informed before the chief of section is awakened, who takes it to the section chief, who takes it to the chief of staff, who takes it to the commanding general for decision. During this process, each person must pause and "think" for a moment before passing on the message. The reduced staff would, by definition, reduce the number of "thinkers" and give the noncommissioned officer a chance to arouse a relatively important person to get the chain started for an answer (the opportunity should appeal to many).

In short, my proposal would have these effects: (1) It would reduce the officers required for all operational staffs. (2) It would restore noncommissioned officers to positions which were designed for them and which concurrently add prestige *and* experience to the job. (3) By widening the gap between the commander and his staff it would preclude any tendency on the part of staff officers to command lower units. Its only real disadvantage is that it charges staff officers with responsibilities in broader fields.

If we find an officer on the staff who cannot properly perform the multiplicity of tasks assigned him, before we start constructing another empire on the staff, let's fire him and get someone who can do the job.

Major Thomas W. Bowen, Armor, *a 1948 graduate of USMA who is currently doing graduate work at Vanderbilt University, has served in the Constabulary and with two armored divisions.*

J. EDGAR HOOVER

(Continued from page 16)

helps communism by diffusing the strength of anticommunist forces. In combatting communism, we must beware of vigilante action. The responsibilities of citizens are to be certain of the facts and to report these facts to the proper authorities.

Develop Democracy

Knowledge of the communist enemy is only the first phase of the battle. This knowledge must be augmented by a continuous revitalization of our own inherently superior strength through the practical, daily exercise and development of our democratic principles. . . .

Reality versus Illusion

Communism has hurled us a mortal challenge. Our response, and the response of free men everywhere, will determine whether or not freedom itself survives. It is no longer sufficient for us to adopt the negative approach of merely reacting defensively to every shift in communist tactics. We must place greater emphasis on the positive role which our democratic way of life can perform in this struggle.

American reality is morally superior to the communist illusion. It is superior, not because it is ours, but because it expresses the universal qualities of human nature. We possess the true legacy of man's age-old struggle from slavery to freedom. Ours is an inheritance solidly grounded on the reality of man's manifold needs and aspirations and on his inherent dignity and worth.

A demonstrated faith in the heritage of democracy is our mightiest weapon in the struggle for the minds of men. Our military might and economic resources, while effective, will not by themselves insure the victory of freedom over communism. These weapons must be reinforced by each citizen's abiding awareness of the intrinsic superiority of our society. From this awareness will develop a revitalized determination, not only to continue our resistance to communism, but to make our living democracy a force of moral persuasion which will capture the imagination of the entire world.

Irons in the Fire

Cushion for the Future

A contract to investigate the feasibility of air-cushion vehicles for Army application has been awarded to Ford Motor Co.'s Aeronutronic Division by the Army Transportation Research and Engineering Command. The air-cushion vehicle derives its support from a cushion of air between the base of the vehicle and the ground. Aeronutronic will investigate stability and control characteristics and performance characteristics when the proposed vehicles are operated over unimproved terrain and water.

New Water Purifier

A 600-gallon-per-hour water purification unit, which can be operated by one man, has been developed by the Army Engineer Research and Development Laboratories, Fort Belvoir, Va. The unit is designed to purify radioactively contaminated as well as ordinary polluted water in less than 25 minutes. Air droppable, the unit includes a water filtering section, a water treating section, and accessories such as pumps, tanks, hoses, generator, and chemicals. Heart of the unit is an "Erdlator," a conical welded aluminum tank in which foreign substances are coagulated and removed.

Fuel Cells for the Future?

A source of electrical power—fuel cells—which may one day be applied to military weapons systems and space vehicles—has been demonstrated by Allis-Chalmers in an experimental fuel cell-powered tractor which develops at least 3,000 pounds of drawbar pull. The electricity driving the tractor comes from 1,008 individual fuel cells which are formed in 112 units of 9 cells each. The units are arranged in four banks and electricity can be taken from any combination of the banks. The cells are fueled by a mixture of gases, largely propane. The gases are tube-fed to the cells where they react in an electrolyte, aided by a catalyst which coats the electrodes of each cell. The chemical reactions within the cells cause a direct current to flow through an external circuit which is connected by bus bar to a standard controller. The two-levered controller regulates the electric supply to the motor, permitting the driver to regulate speed or reverse direction. Using the speed control, the driver places the four banks of cells in series or parallel, varying the amount of current going to the motor. To reverse the vehicle, the driver moves the second lever, changing the polarity of the current flow to the motor.

Machine That "Reads"

A machine that reads handwritten numbers from "zero" through "nine," believed to be the first electronic device that can read connected handwritten material, has been developed by Bell Telephone Laboratories. Here's how the machine works: a writer, using a metal stylus, writes a numeral on a special surface of the machine; he then touches an "identify" button with the stylus and a light appears next to the numeral corresponding to what he has written. The writer, however, must give the machine a fair shake: he must write within the confines of the special surface, he must not lift the stylus between letters, and he must dot his "i's" in "five," "six," "eight," and "nine." Bell believes reading machines could be valuable in any business where information must now be translated into machine language by punched cards, by tape, and by pressing adding machine or typewriter keys.

A lab assistant at Radar Measurements Corp. holds a portable densiometer which can detect high levels of microwave radiation. Powered by batteries and built for one-hand operation, the densiometer can be used by non-technical workers. A simple scale, marked out in red and green areas, shows the operator safe and unsafe levels without computations or numerical interpretations. The densiometer, now being used by the armed forces as field test equipment for fixed and mobile radar, is expected to offer increased protection against accidental exposure to damaging radiations.

HOT SPARKS

Five Army scientists, whose experiments in miniaturization made it possible to increase fivefold the amount of electronic gear which can be contained in missile nose cones, have been awarded $25,000 ($5,000 each). The scientific breakthrough, which it is estimated will save the Army $200 million annually, will lead to dramatic reductions in size, weight, and power consumption of future Army equipment. The scientists, Thomas A. Prugh, Edith M. Olson, Norman J. Doctor, James R. Nall, and Jay W. Lathrop, from the Diamond Ordnance Fuze Laboratory in Washington, D. C., were presented their awards by Army Secretary Wilber M. Brucker.

A $15 million Army contract for development of high precision radar equipment which will locate hostile artillery sites at long range and fix their positions has been awarded to Sylvania Electric Products of Waltham, Mass. Designated AN/MPQ-32, three models of the new radar will be delivered for test to the Army Signal Research and Development Laboratory, Fort Monmouth, N. J.

Temco Aircraft Corp., Dallas, Tex., will manufacture shipping and storage containers for three sections of the Army's Sergeant missile, under a contract with Sperry Utah Engineering Laboratory, prime contractor on the solid-propellant, surface-to-surface missile.

THE MONTH'S BOOKS

Red Planes and Rockets

SOVIET AIR AND ROCKET FORCES
Edited by Asher Lee
Frederick A. Praeger, Inc., 1959
311 Pages; Illustrated; Index; $7.50

Reviewed by
MAJOR PATRICK W. POWERS, Artillery, *who has written many articles and reviews on missiles and rockets for* ARMY.

It is always refreshing to turn your back on the confusing sources of information in the daily papers and be confronted by a reasoned and seasoned serving of details. This is especially true if the subject happens to be about the Soviet Union. This book is a successful attempt to produce a full course of material covering Soviet air power. It is a significant appraisal of the Communist air arm because it furnishes the military reader—perhaps for the first time—with enough background for an evaluation of Soviet air strength.

The book is composed of chapters by different authorities on about forty years of Soviet aviation, including such familiar names as Hanson Baldwin, Raymond Garthoff, and Air Marshal Joubert. Not so familiar but even closer to the scene of action are a former Soviet air officer and a Luftwaffe commander who fought against the Russians. Their subjects range from the beginnings of Soviet military aviation, through the Second World War, to the concepts and structure of airpower embraced by the USSR today.

Surprisingly enough, this varied group of authors agree rather closely on a general picture of Soviet airpower and its objectives.

For example, air defense of the Soviet Union plagues the military and is a reason for their caution in avoiding nuclear retaliation. The balance of air forces among the PVO (air defense), Frontal (tactical), and DA (long-range) air elements is constantly re-examined, but any swing toward strategic bombing has been relatively minor. Today, one half of the 25,000 operational aircraft are still in the tactical category, under Army command, supporting the land forces. The long-range missiles are not considered accurate enough by the Soviet command nor are they in a state of operational readiness to be the chief weapon of Soviet air attack in the next few years; the 1,000 jet bombers of the DA air regiments have that mission.

The book also contains some provocative information. The case of the 25 Rolls-Royce turbojet engines exported to Russia in 1947 from the UK is dealt with. This single act is considered to have made the MIG 15 materialize over Korea; otherwise the Russians could never have developed a sufficient power plant by that time. Politics invades the air forces in the usual Communist form of study groups, essays and early-morning orientations. The point is that the millions of men in their armed forces go through this routine *every day*. The KGB—State Security—is in absolute control, but the personnel seem to live with it. An exception: pilots avoid bailing out of a disabled plane for fear that they will be accused of sabotage.

The impact of this book is this: Soviet air forces are alarmingly different from ours in almost every way: in primary missions, organization, command, and distribution. The question might be asked: Why? Should this affect our own strategic and tactical concepts?

These are the types of questions that linger after reading such an impressive amount of information on one segment of Communist military power. Although the rocket forces (the Army artillery) and the missiles themselves are given scant treatment, this book provides a worthwhile and revealing insight into Soviet air power.

Combined and Joint Duty

THE JOINT AND COMBINED STAFF OFFICER'S MANUAL
By Col. Jack D. Nicholas, USAF; Col. George B. Pickett, USA; Capt. William O. Spears, Jr., USN
The Stackpole Company, 1959
272 Pages; Index; $4.50

Reviewed by
COL. EDWARD L. ROWNY, *Infantry, who served a tour on the International Staff of SHAPE and is now on the Chairman's Staff Group, OJCS.*

It will become increasingly difficult for an officer to get assigned to jobs of higher responsibility if he has not distinguished himself in joint or combined arenas. This is because separate ground, sea and air warfare is, as the foreword of this book makes clear, "gone forever." Not yet so widespread, but rapidly becoming so, is the realization that combined staff and command functioning also is here to stay. Furthermore, a record of good work on combined staffs is every bit as necessary, and even harder to acquire, than on joint staffs.

The officer who has not had joint or combined experience will find commanders increasingly reluctant to take the chance that he can "hack it" in these important spots. There is simply too much at stake. Too often commanders have been chagrined to find that an officer who is good in his own service doesn't succeed in joint or combined work, and they want some evidence that the officer has proved that he has earned a right to a chance at the job. The one thing commanders are sure of is that the officer who is only "average" in his own service fails miserably in the broader environment.

A manual for joint and combined staff officers is, therefore, long overdue. This effort, the pilot model, goes back to first principles and hence is understandably elementary. An officer trained in the command and general staff school of his service will find this manual, for the most part, but a common-sense extension of what he already knows. The more experienced will find it a handy reference work. It has an excellent collection of standard guides which are indispensable, and elusive, when one is in a hurry.

For those who would excel at joint and combined duty, I recommend a careful reading of the concluding chapter. Here the authors do real pioneering when they offer suggestions for success at this kind of duty. The concise and suggestive paragraphs of this chapter are in themselves subjects for chapters—or even whole books. For example, an understanding of the British, French and U. S. staff systems is essential if an officer would make even a modest contribution on a combined staff. Further, a frank discussion of the American's tendency to seclude himself within "the Golden Ghetto," the handicaps he imposes upon himself by overstressing "bigness and efficiency," and his unwillingness to concede the psychological need of other nationals for prestige and status, are all subjects which need more thought.

My own listing of "qualities and attributes" would differ little from that drawn up by the authors. Again, I would like to see the subjects gone into in greater detail. And I would be more critical of the record of U. S. officers in these jobs. I would like to see staff offi-

cers assigned to joint and combined staffs told to "get on with it." Too many of our officers, mostly because they find the experience new, feel they are accomplishing a great deal merely by "getting along." This is an essential first step, but it is only the first step. The effective officer will learn the essentials of his counterpart's background and then will try to persuade him to move on a path that all can follow. He will not be guilty of hypocrisy, nor will he tolerate it in others. This calls for a high order of intelligence, energy, determination, and tact. These are mere clichés until the officer resolves that he will achieve the same results in the joint or combined atmosphere that he would be satisfied with in his own service. This is a challenge to test the worth of the finest. It's a pity so few pick up the challenge. This manual will help some to take the plunge.

The Practical Art of Logistics

LOGISTICS IN THE NATIONAL DEFENSE
By Rear Admiral Henry E. Eccles
The Stackpole Company, 1959
347 Pages; Illustrated; Index; $5.00

Reviewed by
RICHARD M. LEIGHTON, *a specialist in logistics, co-author of the Army's official* Global Logistics and Strategy, 1940-43, *and of its forthcoming sequel covering 1943-45.*

Admiral Eccles is a living monument to what a great military theorist once called the "practical" art of logistics. For 17 years he has been talking, eating, and sleeping logistics—as logistical planner in Washington and overseas, as teacher, lecturer, and writer, and as director of logistical research at two leading universities. This book is more than a survey of the state of the art, though it is that, too. In it the author seems to have set himself the task (though this is not explicitly stated) of erecting a "theory of logistics" where none existed before—where, indeed, many hold there is nothing to theorize about.

This required courage. Though logisticians abound, they seem unable to agree on what logistics is—or is not. The author's own conception of logistics as a bridge between a nation's economy and the armed forces in the field is only one of several in circulation. In any event, he does not tell us which specific spheres of activity are entitled to the logistics label, or what is the relationship between logistics and what the British still call military administration. About all an outsider can determine is that logistics is what logisticians do—and, conversely, that the practitioners of logistics are called logisticians. Economists understandably are inclined to regard logistics as a rather specialized and upstart branch of economics. One of them recently observed that the development of *ideas* about logistics had reached a stage roughly comparable to that reached, in his own field, by mercantilist thought in the seventeenth century; that is, before a recognized science of economics had even come into being. Many seriously doubt whether logistics is, in fact, an independent sphere of action subject to laws of its own.

Nevertheless, Admiral Eccles has built an impressive structure. Almost a third of the book is packed with historical background, definitions, categorizations, basic concepts, frames of reference, and other information—a useful and conveniently packaged primer on the subject. In the remainder of the book he analyzes various aspects of the logistical process: requirements, build-up of resources, control of supply and movement, logistical discipline (but, curiously enough, not procurement or production). He examines "logistic readiness" at some length, and devotes several perceptive chapters to organization, staff coordination, and command. Few will fail to be impressed by the conscientious erudition he brings to his task. Practically every generalization is generously buttressed by facts, figures, and historical examples, and he distributes

Selected Check List of the Month's Books

This run-down of some of the books received during the month preceding our deadline is to give our readers who like to follow current literature a monthly check list of the most important, useful and potentially popular books. Any of these titles may be purchased through the Combat Forces Book Service.

AMERICAN HERITAGE, October 1959. 112 Pages; Illustrated; $2.95. Fine issue for military readers. Laurence Stallings recalls our part in WWI; Fred Cook writes of Peter Francisco, the Revolution's one-man army; Irving Brant protests the commonly accepted picture of Madison in the War of 1812; Phillips Melville relates the U. S. gunboat *Caron-delet's* dramatic dash past Island No. 10.

THE CAT AND THE MICE. By Leonard Mosley. Harper & Brothers, 1959. 182 Pages; Illustrated; $3.50. The story of John Eppler as agent for Rommel in Egypt. He and his partner were the only two captured German spies not to be executed.

DESTROYER SQUADRON 23. By Ken Jones. The Chilton Company, 1959. 283 Pages; Maps; Index; $4.95. The exploits of Arleigh Burke's force in the campaign in the South Pacific. This squadron has been called the greatest in our Navy's history.

FREE WORLD, AWAKEN! By Col. R. A. Ellsworth. Exposition Press, 1959. 344 Pages; $5.00. Deals with "the threat, the dangers and the challenge of world communism to democratic processes and free enterprise." Tries to show how the average man can be a constructive force in helping shape a new world.

GARDNER'S PHOTOGRAPHIC SKETCH BOOK OF THE CIVIL WAR. By Alexander Gardner. Dover Publications, 1959. 216 Pages; Index; $6.00. Reissue of a rare work. Gardner worked with Brady, and many of his pictures usually are attributed to Brady. Some of Gardner's appear in *Photographic History of the Civil War.*

GRAND OLD LADY. By Lt. Col. Carroll V. Glines, Jr. and Lt. Col. Wendell F. Moseley. Pennington Press, 1959. 250 Pages; Illustrated; $3.95. The story of the DC-3, the plane which the authors say has surpassed all others in service, dependability, and contributions to air progress. Douglas calls it Skytrain, it's C-47 to USAF, R4D to the Navy, and DC-3 to airlines. By two USAF officers.

I FOUGHT WITH GERONIMO. By Jason Betzinez with Col. Wilbur S. Nye. The Stackpole Company, 1959. 214 Pages; Illustrated; Maps; Index; $4.95. An Indian's version of the campaigns in the Southwest which gave prominence to Cochise, Victorio, and Geronimo. Raids and battles, desperate affairs, difficult travel through the wilderness, the despair of the hunted. The author's band surrendered to Crook and again later to Miles.

JOHNNY SHILOH. By James A. Rhodes and Dean Jauchius. Bobbs-Merrill Company, 1959. 329 Pages; $3.95. A novel based on the experiences of John Lincoln Clem, the real "Drummer Boy of Shiloh." He enlisted at nine, fought with the Army of the Cumberland, and lived to retire as major general.

MOHAWK BARONET. By James Thomas Flexner. Harper & Brothers, 1959. 400 Pages; Illustrated; Maps; Index; $6.00. Biography of Sir William Johnson of New York, who led an army of Colonials and Indians against the French, took Lake George, defeated and captured Dieskau, and captured Fort Niagara. By the author of *The Traitor and the Spy.*

VICTORY AT SEA. By Henry Salomon with Richard Hanser. Doubleday & Company, 1959. 256 Pages; $5.95. These 517 photos, most of them taken during combat, together with 30,000 words of text and captions, form a record of how the Allies achieved victory in WWII. A great many are stills from the TV serial of the same name.

diagrams, flow charts, and other graphic devices with a lavish hand. No service bias colors his exposition, and he discusses the expanding role of civilians in the logistics field with informed understanding.

Yet it is not certain that the Admiral has achieved a genuine theoretical synthesis. He has, indeed, plenty of theories and insights. One of the more suggestive of these is his observation that logistical activities and support seem subject to their own "Parkinson's Law," a tendency to snowball, to fall into rigid patterns, and to develop a momentum of their own. Yet his brief exploration of these ideas is disappointing, and their rich possibilities as a key to analysis of the whole logistical spectrum are left untapped. The only real element of continuity is the author's preoccupation with the role of command, a theme that pervades the entire book. This, no doubt, is part of his purpose and therefore legitimate enough. On the other hand, it narrows his focus to that segment of logistical activity with which military commanders are directly involved, leaving mostly unexplored the long span of "producer" logistics dominated by private industry, research and development organizations, and the defense agencies that deal with them—certainly a vital part of "logistics in the national defense." Concentration on command, moreover, repeatedly leads the author away from objective analysis of what logistics *is* into admonitory observations on what he feels commanders *ought* to do and be allowed to do. All this is not conducive to an examination of the inherent nature and tendencies of logistics, or the building of theory thereon.

Nevertheless, Admiral Eccles's achievement remains substantial. In a field that has been almost the exclusive preserve of technicians, mathematicians, and the cult of "opsearch," he has chosen the scholar's approach of reflection, generalization, and synthesis. We will wait a long time before someone does better.

The Logistical Art in Practice

UNITED STATES ARMY IN WORLD WAR II. LOGISTICAL SUPPORT OF THE ARMIES, Volume II
By Roland G. Ruppenthal
Office of Chief of Military History, 1959
540 Pages; Illustrated; Maps; Index; $4.50

Reviewed by
COL. ARTHUR SYMONS, Artillery, USAR, *whose mobilization assignment is ODCSLOG and who reviewed Volume I of this work.*

All those fortunate enough to have a copy of Volume I will want the second and concluding volume. As we closed the first volume we had an old-fashioned cliff-hanger on our hands: Will ComZ get organized in time to give the fighting troops the logistical support they need? Although all of us peeked in the back of the book and have reason to believe the Allies won the war in Europe, the suspense is still there. How was the logistical mess outlined in Volume I straightened out?

It wasn't easy. The advances were not always at the speed, and in the direction, planned. Ports were not made available as effective entities when promised. Expenditure rates, both of men and matériel, were not as predicted. The enemy's last gasp at the Ardennes was a logistical nightmare for the Allies. The port tie-ups caused dislocations that resulted in difficulties all the way to VE-day.

In addition to these things, which we might expect, there were other complications. Lack of definite lines of responsibility in the logistical field, preoccupations with uniformity and appearance instead of warmth and wear, lack of a uniform policy on counting assets, and just plain failure to communicate, took their toll. There were strong men in this business, and occasionally they didn't see the big picture. Europe was the main theater, but the War Department could neither act as an appendage to SHAEF nor perform miracles of production *every* time it was necessary.

In some ways, this volume is more valuable than its predecessor because, although it takes up in time just about where the other left off, it tells *how* the bottlenecks were broken—and unfortunately, in some cases, why they were not broken. Colonel Ruppenthal goes into some detail on three of the questions that caused much heart-burning among lower units: replacements, winter clothing, and artillery ammunition.

The sum of the detailed frustrations in this volume adds up to a magnificent How Not To Do It, and future commanders and their logistical advisers can profit by a detailed reading. The most obvious lessons are those that have been taught soldiers through many wars. Clean up the lines of command and staff organization. Don't plan operations in a logistical vacuum. Leave some room for flexibility. Discipline means making an honest effort to perform the will of higher headquarters as well as demanding performance from lower ones.

To those who wonder why the foregoing mentions only the dark side of the picture, this is where the lessons lie. There were many bright spots in the picture too. It would be completely unfair to tax any commander, logistical or combat, with doing less than his best. There were competent men working intelligently within their frame of reference, but not being coordinated from above. There were some who were more interested in tonnage records than in getting the troops what they needed where it was needed, but this too was a failure of the system. It is hard to justify the armies when they listed barber kits and handkerchiefs, to say nothing of chaplains' flags, as "critically short" articles, worthy of frantic handling. On the other hand, artillery units were justified when they complained of broken lots of ammunition that made it impossible to fire with accustomed accuracy; but the logisticians were on safe ground when they pointed out the factors that made lot integrity almost impossible to maintain under theater conditions.

It is interesting to note that Ninth Army was considered the one whose commander had the best understanding of supply; this is only one more in the long list of tributes to Ninth Army's staff work.

You will have to read the book to understand why, in the face of snafu after snafu, the author can write: "It can hardly be claimed that U. S. forces operated on a shoestring. In fact, few armies in history have been as bountifully provided for."

Gideon In Burma

ORDE WINGATE: A Biography
By Christopher Sykes
World Publishing Company, 1959
575 Pages; Illustrated; Maps; Index; $6.00

Reviewed by
RILEY SUNDERLAND, *who helped write part of the Army's official history of the CBI Theater.*

New ideas are rare in any field. They are especially rare in tactics because men have been fighting for so long. Therefore the life story of a professional soldier with two tactical innovations to his credit would probably interest at least a few of his colleagues. But when the innovator is blazingly unorthodox in matters ranging from diet (he would live for days on grapes and onions) to politics (a Gentile, he helped build Israel and Israel's army) then his life will interest even more soldiers, and perhaps their families too. Finally, when it is appreciated that his innovations are most useful in meeting problems of the guerrilla and of nuclear war, then the reflective soldier will want to do at least some selective reading. This unorthodox soldier is the late Major General Orde Charles Wingate, and his biography has been skillfully written by Christopher Sykes.

He was a graduate of the Royal Military Academy at Woolwich where almost until graduation he was, in Sykes's words, "something of a clown, something of a rebel." This led the senior cadets to make him run the gantlet, ostensibly for some minor offense. Wingate paced the corridor with such slow menace that scarcely a hand was laid on him. The punishment was a fiasco, but the humiliation scarred him, and brought out a latent hostility to many sorts of authority. Shortly after, the commandant himself reproved Wingate for sloth and inattention, with results perhaps unique in the history of such lectures: Wingate

marched out, burned the trash he was accustomed to read, and began to be the formidable scholar who mastered Arabic and Hebrew. Rebellion, will, intelligence, nonconformity, all appeared at Woolwich.

Posted to Palestine as an intelligence officer with the garrison keeping order in what was then a British mandate, Wingate found himself in one of the first of the controversial episodes of his career, for he became an ardent Zionist.

After Palestine came the Ethiopian campaign of 1940-41, against a rather large, poorly led, dispirited Italian garrison in a land hostile to it. Given a scratch force of some three battalions of the Sudan Frontier Force and Ethiopian patriots with a few British officers and specialists, Wingate proceeded to attack Italian colonial troops who outnumbered him many times. Constantly snapping at the Italians, enveloping their flanks, mounting attacks across grotesquely wide fronts, Wingate persuaded them to believe he had at least a division and hustled them from one stronghold after another. Sykes tells the story with zest and appreciation and, since he is coming to the climax on Wingate's career, he notes two of Wingate's traits: his ability to persuade and convince very senior officers, and with this gift one that constantly threatened to nullify the first—a continual provoking and angering of the staff who translated directives into action. In effect, Wingate began to fight City Hall, and because he misread British policy toward the Ethiopians whose cause he had adopted, this first battle so depressed him that he tried to kill himself.

Rescued and restored to balance, and feeling even more bitter toward the administrative machine, Wingate was plucked from the professional slough in which he naturally found himself after his suicide attempt by a call from General Wavell, who wanted him in Burma. That was in February 1942.

In the First Burma Campaign, Wingate watched the operation of the well thought out tactical system with which the Japanese won in 1941-42, the use of lightly armed, highly trained veteran troops who moved through jungle to encircle the road-bound, indifferently trained raw conscripts that were all the Allies had that winter, then made them fight their way back through the roadblock to emerge on the far side *sans* morale, *sans* organization, *sans* transport, *sans* artillery. After studying this depressing scene, Wingate evolved an answer. Did the Japanese use roadblocks? Very well, he would use air supply and fly over the blocks. Indeed, his specially organized, meticulously trained forces would be flown in themselves, would strike at the Japanese lines of communication, which lay exposed on the ground, and by breaking up the Japanese rear areas create confusion that would be exploited by regular formations.

Wingate persuaded Wavell, then Churchill, and began to organize. Unhappily for him, he could get his forces only by disrupting existing combat units. This was not welcomed by many of the commanders and staffs involved while Wingate had no thought of placating the opposition he aroused. The resulting combat between Wingate and City Hall in New Delhi, as told by Sykes, shows how an anonymous military bureaucracy can do a great deal to impose its will on those who are formally its masters.

There are minor flaws in the book. But Wingate's story is very well told; the book has enduring value, and is well worth the reading.

Definitive History

THE WAR FOR THE UNION. Volume I: The Improvised War, 1861-1862
By Allan Nevins
Charles Scribner's Sons, 1959
436 Pages; Illustrated; Maps; Index; $7.50

Reviewed by
BRIG. GEN. DONALD ARMSTRONG, *former President of the American Military Institute, who has reviewed many works on the Civil War.*

In its literary excellence, its impartiality, and its thorough documentation, this first of a four-volume history of the Civil War is a historical masterpiece. It will certainly be a fitting monument to the centennial of the Civil War. In this volume Allan Nevins has put together the pieces of social, economic, political and military evidence concerning the ideological differences and the actions of the American people and their leaders in the tragic months before Fort Sumter. It is clear that the war between the states had its roots in the distant past. By 1861 the armed conflict had become inevitable. The origin of the war, as Professor Nevins shows, was the outcome of long years of human selfishness and intolerance and economic and moral differences between North and South. As he examines the impact of the first year of the war on national character, Professor Nevins has no doubt of the destination to which the conflict was leading the American people.

The perspective of a century enables the author to select the essential and to exclude the redundant. He is well aware that war is a continuation of political action. He insists that the Civil War was above all a people's war "fought by every element in the Northern and Southern population." His references to organization and morale disclose their influence on the ability and will to fight on both sides. He has a keen eye for the effect of geography on military strategy. In assessing the causes and consequences of the loss of the Norfolk Navy Yard and the Harpers Ferry armory, he shows his grasp of such egregious errors on the conduct of the war. General Irvin McDowell's organizational and command problems with his "amateur army," as well as the report on Bull Run, with a minimum of tactical detail, is an object lesson of how not to fight a war. When McClellan appears on the scene, his portrait is drawn with remarkable skill in explaining the good and bad points in that general's character and personality. In fact, Professor Nevins makes all his *dramatis personae* come alive with brief but striking delineation.

The political side of the war is likewise impressively covered. The Presidents, North and South, Congressmen and Cabinet members are revealed in their efforts to transform "an unorganized land into an organized nation." Ultimately their labors produced "the key process of the Civil War," a revolution which converted "a loose, inchoate, uncrystallized society into one organized for a mighty and many-sided effort."

This volume promises to be the beginning of the definitive over-all history of the Civil War.

The Will to Live

THE SURVIVAL BOOK
By Paul H. Nesbitt, Alonzo W. Pond, and William H. Allen
D. Van Nostrand Company, 1959
388 Pages; Illustrated; Maps; Index; $7.50

Reviewed by
COLONEL S. LEGREE

This is no simplified once-over-lightly designed to help you acquire your Eagle Scout badge in a few nights of reading. Although the authors have compressed practically everything you should know about survival almost anywhere on earth into 388 pages and index, there is still more material here than any one person could possibly retain unless he were an instructor in the field.

The book is based on the premise that any passenger in an airplane may some day find himself grounded in any type of terrain or water area, hurt or intact, properly equipped or destitute of survival materials. Conditions vary so greatly from area to area (even deserts can differ vastly), and season to season, that there can be few pat answers.

The book takes up a few misconceptions (don't count on a shark not bothering you; there *are* fish that will poison you) and in general offers the unfortunate victim of gravity a much better chance to live to fly again—if he could possibly remember everything in the book. Next best to having a photographic memory is to carry the book with you at all times you are in the air—but read it thoroughly first. Carrying a light, or a signalling mirror, or warm clothing, may make the difference.

The authors believe that the will to live is every bit as important as knowledge and equipment; with all three your chances almost anywhere are rather good.

ASSOCIATION OF THE U. S. ARMY

AIMS AND OBJECTIVES

The Association of the U. S. Army shall be an organization wherein all who are in accord with its objectives may join in the exchange of ideas and information on military matters, and in fostering, supporting, and advocating the legitimate and proper role of the Army of the United States and of all its elements, branches, and components in providing for and assuring the Nation's military security.

COUNCIL OF TRUSTEES

CHAIRMAN
W. F. Rockwell
Pittsburgh, Pa.

Milton G. Baker
Lt. Gen., PARNG, Ret.
Wayne, Pa.

Robert L. Biggers
Detroit, Mich.

John E. Dahlquist
Gen., USA, Ret.
Washington, D. C.

Jacob L. Devers
Gen., USA, Ret.
Washington, D. C.

John E. Hull
Gen., USA, Ret.
Washington, D. C.

Karl R. Bendetsen
Hamilton, Ohio

Edward H. Brooks
Lt. Gen., USA, Ret.
Concord, N. H.

Paul L. Davies
San Jose, California

Manton S. Eddy
Lt. Gen., USA, Ret.
Columbus, Ga.

Matthew B. Ridgway
Gen., USA, Ret.
Pittsburgh, Pa.

OFFICERS

PRESIDENT
Anthony J. Drexel Biddle
Maj. Gen., PaNG
Annville, Pa.

VICE PRESIDENT
Samuel F. Downer
Colorado Springs, Colo.

EXEC. VICE PRESIDENT
W. L. Weible
Lt. Gen., USA, Ret.

SECRETARY
Arthur Symons
Col., USAR

ASST. SECRETARY
Robert F. Cocklin
Col., USAR

TREASURER
Arthur S. Welch
Lt., DCARNG

ASST. TREASURER
N. J. Anthony

Staff Assistants—Esther E. Bennett, Marguerite M. Mattison, C. M. Pierce, La Rue W. Stump, Mildred M. Guthrie, Donna O'Neal, Bonnie L. Garilli, Robert Coleman.

ADVISORY BOARD OF DIRECTORS

Rep. Leroy H. Anderson, Washington, D. C.; **James D. Atkinson**, Washington, D. C.; **Lt. Gen. Milton G. Baker**, Wayne, Pa.; **Karl R. Bendetsen**, Hamilton, Ohio; **Maj. Gen. Anthony J. Drexel Biddle**, Annville, Pa.; **Robert L. Biggers**, Detroit, Mich.; **Judge George H. Boldt**, Tacoma, Wash.; **Richard S. Boutelle**, Hagerstown, Md.

Lt. Gen. Edward H. Brooks, Concord, N. H.; **Harry A. Bullis**, Minneapolis, Minn.; **James H. Carmichael**, Hagerstown, Md.; **J. F. Clark**, New York, N. Y.; **Lt. Gen. W. D. Crittenberger**, New York, N. Y.; **Gen. John E. Dahlquist**, Washington, D. C.; **Paul L. Davies**, San Jose, Calif.; **Gen. Jacob L. Devers**, Washington, D. C.; **Donald Douglas, Jr.**, Santa Monica, Calif.; **Samuel F. Downer**, Colorado Springs, Colo.; **Lt. Gen. Manton S. Eddy**, Columbus, Ga.

Malcolm P. Ferguson, Detroit, Mich.; **Leonard K. Firestone**, Los Angeles, Calif.; **Rep. Gerald Ford**, Washington, D. C.; **Paul L. Galvin**, Chicago, Ill.; **Lt. Gen. James M. Gavin**, Cambridge, Mass.; **Harvey Gaylord**, Fort Worth, Tex.; **Luther L. Hill**, Des Moines, Iowa; **Stanley Hiller, Jr.**, Palo Alto, Calif.

Lt. Gen. C. R. Huebner, New York, N. Y.; **Gen. John E. Hull**, Washington, D. C.; **Judge George W. Latimer**, Washington, D. C.; **Brig. Gen. Henry Cabot Lodge, Jr.**, New York, N. Y.; **Frank McCarthy**, Beverly Hills, Calif.; **Dr. James W. McRae**, New York, N. Y.; **Maj. Gen. Richard K. Mellon**, Pittsburgh, Pa.; **Lt. Gen. Troy H. Middleton**, Baton Rouge, La.

Chap. (Maj. Gen.) Luther D. Miller, Washington, D. C.; **John D. Montgomery**, Junction City, Kans.; **Brig. Gen. de Lesseps Morrison**, New Orleans, La.; **Maj. Gen. Kenneth D. Nichols**, Washington, D. C.; **Maj. Gen. George Olmsted**, Washington, D. C.; **Frank Pace, Jr.**, New York, N. Y.; **William S. Paley**, New York, N. Y.; **Howard C. Petersen**, Philadelphia, Pa.; **Brig. Gen. Wendell C. Phillippi**, Indianapolis, Ind.

Sen. Charles E. Potter, Washington, D. C.; **Ogden R. Reid**, New York, N. Y.; **Gen. M. B. Ridgway**, Pittsburgh, Pa.; **Willard F. Rockwell**, Pittsburgh, Pa.; **Dean Rusk**, New York, N. Y.; **Maj. Gen. Charles E. Saltzman**, New York, N. Y.

Sherrod E. Skinner, Detroit, Mich.; **Charles M. Spofford**, New York, N. Y.; **Gen. Maxwell D. Taylor**, Washington, D. C.; **Rep. Olin E. Teague**, Washington, D. C.; **Dr. Charles A. H. Thomson**, Washington, D. C.; **Sen. Strom Thurmond**, Washington, D. C.; **Lt. Col. Jack Warner, Jr.**, Hollywood, Calif.; **Brig. Gen. Robert E. Wood**, Chicago, Ill.; **Ben H. Wooten**, Dallas, Tex.

CHAPTERS

AUGUSTA AREA CHAPTER—Address by Gen. John E. Dahlquist, and a premiere showing of a technicolor film, "This is Fort Gordon," were two of the highlights of the big autumn meeting on 8 October. Other speakers included Mayor Millard A. Beckum, of Augusta, and Mr. L. C. Phillips, Chapter President. Band music and the Fort Gordon Choral Group added to the entertainment. Visitors to the post ate in unit messes before the event.

BOGARDUS S. CAIRNS CHAPTER—More than 1,000 members and guests heard Rep. George W. Andrews speak on "The Army's Role in the National Defense" on 15 October at the Sports Arena, Fort Rucker. Other speakers were Rep. Robert L. F. Sikes, of Florida, and Brig. Gen. Ernest F. Easterbrook. Local high-school bands, and a sea-food dinner, rounded out the program.

CONNECTICUT CHAPTER—On 14 October, at the Army Reserve Training Center, West Hartford, 86 members and 5 guests heard Mr. D. Gordon Hunter speak on the status of American weapons, and viewed a film on the same subject which Mr. Hunter produced in cooperation with the Department of Defense.

EL PASO CHAPTER—Regular fall meeting on 19 October heard Col. Jacob F. Mynderse, DCS for Plans and Training, Air Defense School, discuss USSR's disarmament overtures. Lt. Col. Paul Lance reported on AUSA's 1959 Annual Meeting, and Mr. Chris Fox, Civilian Aide to the Secretary of the Army, reported on the Civilian Aides' Meeting at Fort Bragg, combined with a plea to the Chapter to resist further whittling away of the Army's missile role.

FRANKFURT CHAPTER—New officers elected on 30 September. Principal speaker at meeting was Rep. Stuyvesant Wainwright (N. Y.), who spoke on Mr. Khrushchev's visit to the U. S.

INDIANA CHAPTER—Lt. Gen. W. H. Arnold, CG, Fifth Army, addressed dinner meeting on 14 October at the Columbia Club, Indianapolis. More than 300 attended, a large proportion of them civilians who were invited through the Chamber of Commerce. Press coverage was exceptionally good; General Arnold's plea for building national strength was well received.

KENTUCKIANA CHAPTER—New officers took the reins at meeting on 22 September; meeting heard report of delegates to 1959 Annual Meeting.

MASSACHUSETTS BAY CHAPTER—At special ceremony on 13 October at Boston Army Base, Maj. Gen. Otis M. Whitney presented charter to Col. Quincy A. Shaw, Jr., Chapter President.

NEBRASKA CHAPTER—Business meeting on 28 September elected officers. Col. Steve Tillman, USAR-Ret., was guest at meeting and made a short talk.

NEW YORK CHAPTER—Maj. Gen. Raymond W. Curtis, CG, II Corps (Reserve) addressed dinner meeting at Officers Club, Governors Island, on 22 September; attendance included 100 members and 25 guests. Among those attending were Lt. Gen. B. M. Bryan, CG, First Army; Mr. Don Belding, Civilian Aide to Secretary of the Army for California (and former Trustee, AUSA); and Hon. Thomas E. Troland, Civilian Aide for Connecticut.

READING CHAPTER—Chapter meeting on 15 October heard Maj. Gen. Anthony J. Drexel Biddle, AUSA National President, make a strong plea for maintenance of a tough military capability and the will to trigger it if necessary. Representatives from Pocono Mountains Chapter and William Penn Chapter, and Maj. Gen. Alvin L. Gorbey, CG, Valley Forge Army Hospital, and other military commanders,

FORT HUACHUCA, ARIZ. Clayton Smith, President of Southern Arizona Chapter, is interested in the theory and operation of a Doppler Navigation System as explained to him by SP5 Johnny Montoya. Army's Electronic Proving Ground was host to Chapter on 16 September.

PULLMAN, WASH. Maj. Gen. Gilman C. Mudgett, who presented charter and was principal speaker at meeting on 7 October, discusses AUSA with Cougar Company officers. With him are, left to right: Capt. Robert Gifford, Second Lt. Dean Knox, First Sgt. James Fox, First Lt. Jon Hanson.

BAD KREUZNACH, GERMANY. Newly elected officers of 8th Infantry Division Chapter elected at meeting on 7 August. Left to right: Brig. Gen. John W. Keating, President; Maj. Herman Webel, Jr., Executive Vice President; Maj. George J. Harold, Treasurer; MSgt. Charles T. Root, Secretary.

FORT RUCKER, ALA. Head table at the meeting of Bogardus S. Cairns Chapter on 15 October. Left to right: Brig. Gen. E. F. Easterbrook, Commandant of Army Aviation Center; James Park, Chapter President; Representative George W. Andrews.

FORT SMITH, ARK. MSgt. Daniel A. Reed prepares to raise first 49-star color in a Fort Smith school, on 20 September. Others are, left to right: Jim Beckman, Ozark Chapter President, who donated colors; Chris Corbin, Sr., Superintendent of Schools; Mrs. Floyd Ritchie, Fairview School principal.

VENTURA, CALIF. Santa Barbara-Ventura County Chapter holds its first meeting with civic and Navy guests. Left to right: Brig. Gen. Charles A. Ott, President; Hon. E. T. Abbott, Mayor of Santa Barbara; Lt. Comdr. Sam P. Guilatt, USNR (front); Adm. Stuart S. Murray, who commanded USS Missouri in Tokyo Bay surrender; Al Albinger, President of Ventura Chamber of Commerce; Tod H. Wagner, Commander of Ventura VFW post; Brig. Gen. A. G. Elegar, Deputy Commander of Fort Ord.

OKINAWA. As result of recent membership drive, USARYIS Headquarters Company holds worldwide record for highest AUSA membership in any small unit. Of 59 members, 44 are new registrants and 15 older members. Holding plaque of Ryukyus Chapter are Capt. Andrew Ligda, company commander, and First Sgt. Paul E. Cartwright.

attended the dinner meeting. Col. W. E. Homan was master of ceremonies.

SOUTH FLORIDA CHAPTER—Maj. Frank S. Wright, PIO, 51st Infantry Division, spoke to the Chapter on 14 October on the national war strategy seminar held at the National War College in August, and on his tour of the Soviet Union.

SOUTHWEST OKLAHOMA CHAPTER—Lt. Gen. Walter L. Weible, AUSA's Executive Vice President, addressed Chapter on 8 October at Fort Sill. Rep. Toby Morris of Oklahoma's 6th District, Hon. C. R. Ellsworth, Mayor of Lawton, and Generals Bames, Burger, Hartshorn, Sanders and Brittingham attended along with almost 500 others.

ROTC COMPANIES

CHIEFTAIN COMPANY, Seattle University—Informal smoker meeting on 6 October welcomed MS III cadets. Lt. Col. Norman S. Horner, Company Adviser, spoke on AUSA and the benefits of membership; Lt. Col. Michael J. Dolan, PMST, discussed the cadets' responsibilities as future officers and the necessity for recruiting friends of the Army. Film, "The Battle of San Pietro," was shown.

COLORADO STATE UNIVERSITY COMPANY—Meeting on 29 September planned programs for coming year. Army Ca-Dettes were introduced to the Company on 8 October; each platoon or company in the ROTC unit will sponsor one of the Ca-Dettes. After seeing film, "Qualitative Strength of the U. S. Army," a social hour gave Company members the opportunity to become acquainted with prospective Company members and the Ca-Dettes.

COUGAR COMPANY, Washington State University—Charter presented at banquet meeting on 7 October by Maj. Gen. Gilman C. Mudgett, Deputy CG, for Reserve Components, Sixth Army. Guests included Dr. Howard W. Barlow, military coordinator for the University; Col. W. W. Bailey, PMST; Lt. Col. J. M. Bain, Chief of ROTC Affairs, Sixth Army; and Lt. Col. J. C. Brink, Company Adviser.

DAKOTA COMPANY, North Dakota Agricultural College—Company heard Dr. Ezzat Asaad, a physician from Cairo, speak on "Modern Egypt and the Suez Crisis." Guidon, the girls' auxiliary, attended the supper meeting.

DICKINSON COLLEGE COMPANY—Film, "D-day," and reports by three cadets who attended AUSA's 1959 Annual Meeting, highlighted 13 October meeting.

EASTERN CADET OFFICERS COMPANY, Eastern Kentucky State College—Cadet Charles W. Jarvis reported to the Company at 23 September meeting on his attendance at AUSA's 1959 Annual Meeting. Meeting on 7 October elected Miss Janet Warren as Battle Group Sponsor.

EDMUND R. WALKER COMPANY, University of Connecticut—A reception for the new PMST, Col. George H. Gerhart, featured meeting on 8 October.

EVERGREEN COMPANY (EWCE), Eastern Washington College of Education—Col. Edwin G. Nilsson, PMST, spoke to the Company on 15 October about the Army's mission in Korea. New officers were elected.

INDIANAPOLIS, IND. Officers of Indiana Chapter after dinner meeting on 14 October. Left to right: Lt. Col. Jack K. Elrod, First Vice President; George M. Davidson, Civilian Aide to Secretary of the Army; Lt. Gen. William H. Arnold, CG, Fifth Army, and principal speaker; Representative Fred Wampler; Maj. Walter J. Schuchmann, President.

NORFOLK, VA. Plans for quarterly meeting on 24 November are discussed by newly elected officers of South Hampton Roads Chapter. Left to right: Conan W. Vaughan, President; James F. Olive, Second Vice President; Arthur C. Marquess, Jr., Secretary; R. E. Winfreed, Treasurer; Sgt. Maj. Milton Z. Fisk, Corresponding Secretary.

FLORIDA SOUTHERN COLLEGE COMPANY—Organization meeting on 16 October elected new officers.

IDAHO STATE COLLEGE COMPANY—During meeting on 30 September, Cadet Earl Royse, Captain of the Company, and Cadet James Y. Anderson reported on AUSA's 1959 Annual Meeting, and Captain Royse reported on the informal meeting of the Company held at Fort Lewis during the ROTC summer camp at Fort Lewis. Applications were accepted from 21 cadets. Lt. Col. H. P. Rimmer, PMST, reported to meeting on 21 October on ROTC summer camp at Fort Lewis, Wash.

KANSAS UNIVERSITY COMPANY—Cadet Robert D. Ohmart, Company Captain, reported to the Company on 15 October on his experiences at AUSA's 1959 Annual Meeting.

LaSALLE ROTC COMPANY, Oakdale, N. Y.—Company is arranging for a Company area in the new canteen building. Meeting on 4 October heard Cadets Krzos and March report on AUSA's 1959 Annual Meeting.

LOYOLA UNIVERSITY COMPANY, Chicago, Illinois—Opening meeting, on 8 October, was devoted to orientation of prospective members.

MONTANA STATE UNIVERSITY ROTC COMPANY—New members were welcomed into the Company on 7 October. Cadet William H. Mott spoke on his attendance at AUSA's 1959 Annual Meeting; the MS IV cadets gave the MS IIIs the benefit of their ROTC summer camp experiences.

PUERTO RICO COMPANY, University of Puerto Rico—Fifty-six pledges attended the first meeting of the year for Puerto Rico Company on 17 September. The Company elected officers and planned for events for the coming year.

ROBERT E. SYLVEST COMPANY, Northwestern State College of Louisiana—Sgt. Robert Cortinez, a reservist studying at NSC, and a graduate of both the Army's airborne and ranger courses, was the principal speaker on 15 October. Sergeant Cortinez spoke on Army training, and conducted a question-and-answer session after the formal portion of his presentation.

ST. NORBERT COLLEGE COMPANY—At meeting on 22 October, the Company began its planning to send two members to AUSA's 1960 Annual Meeting.

SOONER COMPANY, University of Oklahoma—Principal speaker on 22 October was Col. Ronald Shurman, Research Professor of Management, who spoke on "The Duties of the Army Staff Officer." Colonel Shurman, a member of the University of Oklahoma faculty, is a retired Army officer.

VIRGINIA POLYTECHNIC INSTITUTE COMPANY—Meeting on 7 October nominated 28 new members; planned activities for coming year.

WASHINGTON AND JEFFERSON ROTC COMPANY—Film, "A Sharper Sword and a Stronger Shield," plus background of AUSA for potential members, made up program content of 7 October meeting. Business portion laid plans for future meetings and events.

AUSA MEMBERSHIP INSIGNIA ITEMS

As the Association of the United States Army grows in membership and public notice, more and more members are showing their pride in AUSA by using and wearing AUSA Insignia items. They are conversation pieces in any company.

The lighter that is unconditionally guaranteed. The standard of quality for lighters for military men, engraved with the official AUSA insignia for ready identification or as a conversation piece.

Price to Members, postpaid **$4.75**

AUSA PLAQUES

Gold-finished, molded Burwood, 13" in diameter. Perfect for den or office.

$5.00

YOUR PERSONAL MEMBERSHIP PACKAGE

You may order these items (except decals) separately, but we recommend the complete package—one order, and you save 10%.

HERE IS WHAT YOU GET IN YOUR MEMBERSHIP PACKAGE!

U. S. AND U. S. ARMY FLAGS, each 4" x 6", gold-fringed, mounted on an ebonized-wood staff with a gilded spearhead. Staffs fit into a circular, ebonized-wood base. Each set comes in its own handsome box, so that it's easy to give these flags as gifts. Forty-eight stars.

Price if ordered separately $2.00

GOLD-FILLED LAPEL BUTTON, for wear with civilian clothes, always identifies you as an AUSA member. Buttons are 7/16" in diameter, and carry the Association seal.

Price if ordered separately $1.00

PLASTIC BRIEF CASE with plastic zipper closure in a handsome dark green—stamped with the Association seal in gold. Size is 11½" x 14", big enough to handle your legal-size as well as letter-size papers.

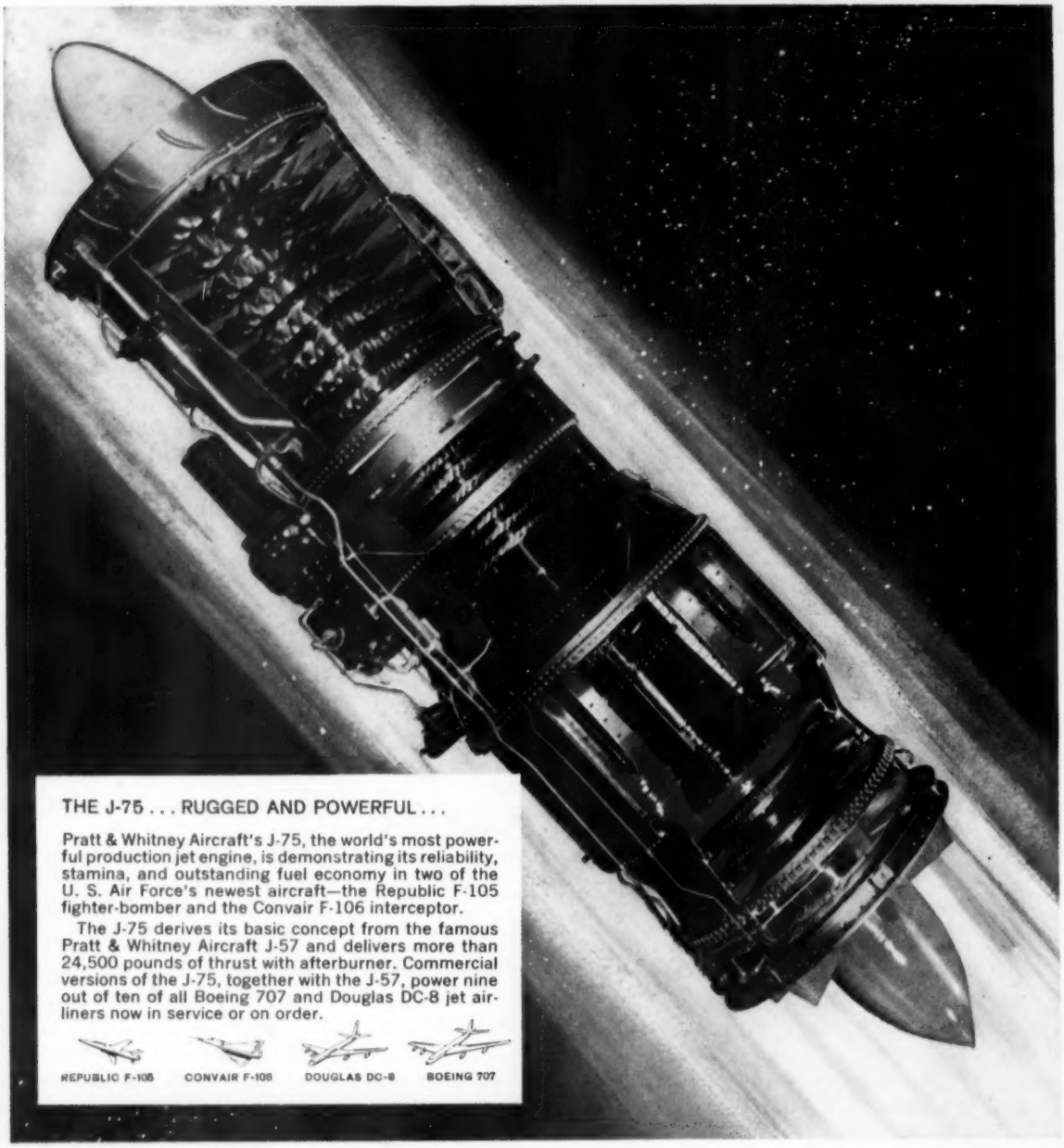
Price if ordered separately $1.25

ASSOCIATION DECALS, for your car windows, show the Association seal in gold. Value 10¢ each. You get two decals as part of your Membership Package. Decals cannot be ordered separately in small quantities. For larger quantity prices, write the Association.

TOTAL VALUE OF SEPARATE ITEMS ABOVE $4.45

PRICE TO MEMBERS FOR THE COMPLETE PACKAGE $4.00

AUSA MEMBERS SERVICE 1529 18th Street, N.W., Washington 6, D. C.



THE J-75 . . . RUGGED AND POWERFUL . . .

Pratt & Whitney Aircraft's J-75, the world's most powerful production jet engine, is demonstrating its reliability, stamina, and outstanding fuel economy in two of the U. S. Air Force's newest aircraft—the Republic F-105 fighter-bomber and the Convair F-106 interceptor.

The J-75 derives its basic concept from the famous Pratt & Whitney Aircraft J-57 and delivers more than 24,500 pounds of thrust with afterburner. Commercial versions of the J-75, together with the J-57, power nine out of ten of all Boeing 707 and Douglas DC-8 jet airliners now in service or on order.

REPUBLIC F-105 CONVAIR F-106 DOUGLAS DC-8 BOEING 707

POWER IS THE KEY!

. . . the key to flight without boundaries . . . power that meets every challenge of speed and distance.

Today Pratt & Whitney Aircraft builds jet power for America's quick and rugged fighting aircraft, for guided missiles, rockets, and swift commercial jetliners.

Through constant research and a traditional talent for utilizing the finest engineering tools, propulsion for the future is being developed and produced at Pratt & Whitney Aircraft, including airborne nuclear power and other advanced applications of energy for space vehicles. These projects will open still new frontiers in the world of flight.

Flight Propulsion by **PRATT & WHITNEY AIRCRAFT**

East Hartford, Connecticut

A division of United Aircraft Corporation